

MOSELEY
ON
SUGAR.

1799.



A
T R E A T I S E
ON
S U G A R.

BY
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AUTHOR OF
A TREATISE ON TROPICAL DISEASES;
MILITARY OPERATIONS;
AND THE CLIMATE OF THE WEST INDIES;
AND
A TREATISE ON COFFEE:
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AT PHILADELPHIA, &c. &c.

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TREATISE

SUGAR.



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AND LONDON, &c.

LONDON

JOHN JOHNSON, ST. PAUL'S CHURCH-YARD.

SUGAR CANE.

PART THE FIRST.

- | | |
|---------------------------------|--|
| Arundo Saccharifera. | C. BAUHIN, <i>Pin.</i> 18. |
| Arundo Saccharina. | J. BAUHIN, 2. 531. |
| Arundo Sacchari. | F. HERNANDEZ, <i>p.</i> 109. |
| Calamus Saccharatus. | MUNTING, <i>Pl. Cult.</i> <i>p.</i>
284. |
| Cannæ Dulces. | P. MARTYR. |
| Canna Mellea. | CÆSALPIN, <i>Hist. Plant.</i>
<i>p.</i> 182. |
| Canna Saccharifera. | OGILBY, <i>Chin.</i> I. 228. |
| Canna Saccharina. | NIEUHOF, <i>p.</i> 89. |
| Canna Sacchari. | LAET, <i>lib.</i> I. <i>p.</i> 27. |
| Harundo Saccharifera. | PARKINSON, <i>Theatr.</i>
<i>Botan.</i> 1210. |
| Roseaux, ou Cannes de
Sucre. | LABAT, <i>vol.</i> I. <i>p.</i> 228. |
| Roseaux de Sucre. | LUSSAN. |

Saccharum floribus pa- LIN. *Sp. Pl.*
niculatis.

Tacomareé, five Arun- PISO, *Lib. IV. Cap. I.*
da Saccharifera.

Viba & Tacomareé & IB.
Canna Sacchari.

Vubæ & Tacomareé MARCGRAV, 82.
Brafilienfibus.



HISTORY

OF THE

SUGAR CANE.

I HAVE undertaken a difficult task, in attempting to give an History of SUGAR.

Much time has elapsed since the cultivation of the sugar cane has been generally known, and sugar in almost general use. Yet no person hitherto has connected any regular series of facts on the subject; a subject of the first importance in commerce: and, more than that, a subject now influencing the dispositions to health or disease, of the greater part of the inhabitants of the earth.

The materials which present themselves for my purpose, are disjointed and contradictory. The rays, which scarcely illumine the surface of the mass I am to penetrate, are feeble and confused. To discover a foundation, on which order and arrangement may rise, I must toil through trackless regions of obscurity.

The most antient author, who mentions the sugar cane, is THEOPHRASTUS, who lived 321 years before the Christian æra. I shall begin

with him ; and recite a few passages and allusions from other authors, as they descend in point of time, which have been supposed relative to this plant.

THEOPHRASTUS says, in his chapter on honey,—

ΟΤΙ ΑΙ ΤΟΥ ΜΕΛΙΤΟΣ ΓΕΝΕΣΕΙΣ, ΤΡΙΤΛΑΙ· Η ΑΠΟ ΤΩΝ ΑΝΘΩΝ, ΚΑΙ ΕΝ ΟΙΣ ΑΛΛΟΙΣ ΕΣΤΙΝ Η ΓΛΥΚΥΗΣ· ΑΛΛΗ ΔΕ ΕΚ ΤΟΥ ΑΕΡΟΣ, ΟΤΑΝ ΑΝΑΧΥΘΕΝ, ΥΓΡΟΝ ΑΠΟ ΤΟΥ ΗΛΙΟΥ ΣΥΝΕΨΗΘΕΝ ΠΕΣΗ, ΓΙΝΕΣΤΑΙ ΔΕ ΤΟΥΤΟ ΜΑΛΙΣΤΑ ΥΠΟ ΠΥΡΑΜΗΛΟΝ· ΑΛΛΗ ΔΕ ΕΝ ΤΟΙΣ ΚΑΛΑΜΟΙΣ*.

“The generation of honey is threefold : the first sort is from flowers, or other things in which there is sweetness : the second, from the air, which, when there are dews, is concocted by the heat of the sun, and falls particularly in harvest time : the third sort is from canes or reeds.”

He mentions that the second sort of honey, or that generated from the moisture in the air, falls on the earth, and on plants ; and is found chiefly on the boughs of the oak, and *Tilia*, or lime tree.

By the cane, which yields the third species of honey, it is supposed that he implies the sugar cane ; and the honey, the juice, perhaps inspissated, of that plant.

* Ed. HEINSII, 1613, p. 475.



THEOPHRASTUS mentions another sort of reed or cane, growing in marshy places in Egypt, with sweet roots. Speaking of the different properties of the different parts of plants, he says,—

Καθαπερ εν Αιγυπτῳ του καλαμου του εν τοις ελεσιν· εχει μεν γαρ τινα γλυκυληα και αλλως επι των ακρων, αλλ' επι βραχυ παντων. Εκεινος δε δια την ευηροφιαν απαλος γε επι πλειον εστι και γλυκυσ. Εχουσι δε και αι ριζαι την γλυκυληα μεχρις ου αν ξηρανθωσιν. Αναξηρανθειςαι δε ουκ-εστι, το γαρ ξηρον, ουτ' εδωδιμον, ουτ' εγχυλον*.

“As in the cane which grows in marshy places in Egypt: the extreme parts of which are also sweet, but in a small degree. But that which yields the most nutriment, and is tender and sweet, rises from the largest parts. The roots retain their sweetness until they are dry. Then they lose their sweetness, and are neither proper for food, or grateful.”

Whether THEOPHRASTUS, who was a Lesbian, had ever seen this reed in Egypt with sweet roots, or whether he had the account of it from others, or whether such a reed really

* De Causis Plant. lib. VI. c. 16. ed. HEINSII.

exists, may be equally a matter of conjecture; but I have given his account of it, because other writers have mentioned this reed with sweet roots probably from him: and many have supposed the *Sugar Cane* was the reed alluded to, though erroneously described. But this will be better understood by comparing this passage in THEOPHRASTUS, with what has been said by other early writers.

VARRO (68 years before the Christian æra), in the following verses, observes,—

*Indica non magnâ nimis arbore crescit arundo ;
Illius è lentis premitur radicibus humor,
Dulcia cui nequeant jucco contendere mella*.*

“ The Indian reed does not grow to a large tree; from its viscid roots a liquor is pressed, to which honey cannot be compared for sweetness.”

DIONYSIUS AFER (*anno* 3. *Ær.* Chr. *SAX. Onomast.*) mentions that the Indians drink the juice of the *Ερυθραῖος καλάμος*, or Indian cane †.

* VARRO Narbonensis, or, as he is sometimes called, VARRO *Atacinus*, a poetical writer, contemporary with the celebrated M. T. VARRO.

† *Periegesis*, viz. 1127.

STRABO (*anno* 19), in his 15th book of Geography, in the description of India, says, on the authority of NEARCHUS (Alexander's admiral), who lived 325 years before the Christian æra,—

Εἰρηκε δὲ καὶ περὶ τῶν καλάμων ὅτι ποιοῦσι μέλι μελισσῶν μὴ οὐσῶν· οὐ γὰρ δένδρον εἶναι καρποφόρον· ἐκ δὲ τοῦ καρποῦ μεθύειν *.

“ He (NEARCHUS) relates, that the reed (in India) yields honey without bees; but it is not a fruit-bearing tree: yet the fruit intoxicates.”

The latter part of this passage has perplexed commentators.

In the same page STRABO says, on the authority of ERATOSTHENES,—

Τὰς ρίζας τῶν φυῶν καὶ μάλιστα τῶν μεγάλων καλάμων, γλυκείας καὶ φύσει καὶ ἐψησει.

“ The roots of plants (in India), particularly of the great reeds, are sweet by nature, and by decoction.”

He also mentions the *καλαμος Ἰνδικός* growing abundantly in Æthiopia.

SENECA (*anno* 62) in his 84th Epistle, has the following passage:—

* P. 1016. edit. 1707.

Aiunt inveniri apud Indos mel in harundinum foliis ; quod aut ros illius cæli, aut ipsius harundinis humor dulcis, et pinguior gignat. In nostris quoque herbis vim eandem, sed minus manifestam, & notabilem poni ; quam prosequatur et contrahat animal huic rei genitum.

“ They say that, in the Indies, honey is found in the leaves of canes ; which is produced by the dew, or the sweet juice of the cane itself, concreting. In our herbs also there is the same quality, but in a less degree ; from which the bees extract honey.”

This, being in the time of NERO, proves that the Romans, at that period, knew but little of the sugar cane, and nothing of the manufacture of sugar.

LUCAN (*anno 62*) says, in the 237th verse of his third book, when speaking of the Indians near the Ganges,—

Quique bibunt tenerâ dulces ab arundine succos.

“ They drink the sweet juices of the tender reed.”

PLINY (*anno 78*) in the 32d chapter of the 6th book, speaking of the *Insulæ Fortunatæ*,
OF

or what are now called the Canary Islands, asserts, on the authority of *Juba*, that, in the island called *Ombrios*,—

Arbores similes Ferulæ, ex quibus aqua exprimatur; ex nigris amara; ex candidioribus potui jucunda.

“There are trees resembling the *Ferula*, from which water may be expressed; the water from the black sort is bitter; but that from the white grateful to drink.”

SALMASIUS, GEOFFROY, and many other authors, have believed that these trees, mentioned by PLINY, were sugar canes; but certainly without reason.

If we may credit the Spanish historian of these islands, there was in his time*, in the same island, now called *Ferro*†, or *Hierro*, a marvellous tree, which made up for the deficiency of springs, and contributed largely towards supplying the inhabitants of the island with water. Some writers consider PLINY's remark applicable to this vegetable fountain, which is described as follows.

* In the year 1632.

† *Ferro* is about fifteen leagues in circumference, and five in breadth. It is subject to frequent droughts, there being only three inconsiderable springs in it.

“The

“ The district in which this tree stands is called *Tigulabe*, near to which, and in the cliff or steep rocky ascent that furrounds the whole island, is a narrow gutter or gully, which commences at the sea, and continues to the summit of the cliff, where it joins or coincides with a valley, which is terminated by the steep front of a rock. On the top of this rock grows a tree, now called *Til*, but, in the language of the antient inhabitants, *Garfe*, i. e. Sacred, or Holy Tree. Its leaves constantly distil such a quantity of water as is sufficient to furnish drink to every living creature in *Hierro*; Nature having provided this remedy for the drought of the island. On the North side of the trunk are two large tanks or cisterns of rough stone, or rather one cistern divided, each being twenty feet square, and sixteen spans in depth. One of these contains water for the drinking of the inhabitants, and the other that which they use for their cattle, washing, and such like purposes. Every morning, near this part of the island, a cloud or mist arises from the sea, which the South and Easterly winds force against the fore-mentioned steep cliff; so that the cloud, having no vent but by the gutter, gradually ascends it, and from thence advances slowly to the extremity of the valley, where
it

it is stopped and checked by the front of the rock which terminates the valley, and then rests upon the thick leaves and wide spreading branches of the tree, from whence it distils in drops during the remainder of the day, until it is at length exhausted, in the same manner that we see water drip from the leaves of trees after a heavy shower of rain.

“ This distillation is not peculiar to the *Garfe*, or *Til*; for the *Brefos*, which grow near it, likewise drop water; but, their leaves being but few and narrow, the quantity is so trifling, that though the natives save some of it, yet they make little or no account of any but what distils from the *Til*.

“ A person lives on the spot near which this tree grows, who is appointed by the council to take care of it and its water. He every day distributes to each family of the district seven pots or vessels full of water, besides what he gives to the principal people of the island *.”

That some trees and shrubs may, on hydraulic principles, become syphons to the earth, and their extremities discharge a considerable quantity of water imbibed from the roots, is certainly possible; and such trees are related

* GLASS's History of the Canary Islands, p. 275, anno 1764.

by travellers to exist in Africa and South America. But the history of the *Garfe* is scarcely within the compass of credibility. There may be some trees peculiar to *Ferro*, abounding with moisture, which PLINY had heard of; and, on that account, I have introduced the preceding relation. Indeed, they are mentioned by several subsequent writers; particularly by PETER MARTYR, who says, “In the island of *Ferro* there is no other water that may be drunk, but only that is gathered of the dew which continually distilleth from one only tree, growing on the highest bank of the island, and falleth into a round trench made with man’s hand.” *Decad. I. Lib. I. anno 1493.*

STATIUS (*anno 95*), *Sylvarum, Lib. 1. 6. 15.* has a passage, which has been the foundation of much dispute among critics and commentators; some contending that the reading should be *cannæ*, canes; others, that it should be *caunæ*, figs: so called from *Caunus*, a town in Egypt, famous for figs.

Et quas percoquit Ebusita cannas.

“The island of *Ebusus* (or *Ivica*, in the Mediterranean, near Valencia in Spain), which yields ripe canes.”

“ *Et*

Et quas percoquit Ebofea caunas.

“Ebusus which ripens (*caunæ*) figs.”

SOLINUS (*anno* 218), in the 52d chapter of his Polyhistoria, in describing India, says,—

Quæ palustria sunt, arundinem creant ita crassam, ut fissis internodiis lembi vice veſtitet navigantes; è radicibus ejus exprimitur humor dulcis ad melleam suavitatem.*

“The marshy places produce reeds so large, that between the joints, when divided in the middle, they are capable of carrying people in the manner of boats; from the roots of this reed a juice is expressed as sweet as honey.”

SOLINUS has taken the first part of this passage from PLINY; who, as well as HERODOTUS, says, that the Indians make boats, or canoes, from canes growing in marshy places: but neither HERODOTUS nor PLINY mention the sweetness of their roots.

HERODOTUS, 444 years before the Christian æra, in his *Ithalia*, says the Indians, who inhabit the morasses of the river, feed on raw fish, which they catch in boats made of reeds; a single joint of which is large enough

* P. 275, edit. Goezii, 1777.

for one boat : and PLINY, in the 2d chapter of his 7th book, says, in India the canes grow to so great a size, that, from a single joint, a boat may be made capable of carrying three people.

I have now selected every thing, excepting the trivial common-place matter (which may be found in almost every Lexicon), respecting the *cane*, or *reed*, to which the property of *sweetness* has been attributed, by every writer preceding the reign of priestcraft, ignorance, and oblivion. I shall pass over that long night of human reason, where nothing is to be found,—to the more certain and determinate history of the sugar cane.

On the discovery of the Western hemisphere, the Sugar Cane was found on the continent ; and also in some of the Atlantic islands ; but the art of making sugar, it is said, never was practised by the aborigines of the West Indian islands, until they were settled by Europeans ; nor by the Mexicans, or Peruvians, or any other native inhabitants of South America, previous to their subjugation by the Spaniards.

Of this there may be some doubt, with respect to Mexico ; but not as to any other part of the continent, or any of the islands.

Before

Before the discovery of the West Indies, by the Spaniards, in 1492; before the discovery of the East Indies, by the Portuguese navigators, in 1497; and before the discovery of the Brazils, by the same nation, in 1500; abundance of sugar was made in the islands of Sicily, Crete, Rhodes, and Cyprus.

The sugar cane is supposed to have been brought to these islands originally, from India, by the Saracens; and from thence transplanted into some parts of Italy; and to Spain, from Africa, by the Moors.

In Spain, the sugar cane was first planted in Valencia, and afterwards in Granada, and Murcia. Sugar was formerly, in these Southern parts of Spain, produced in great quantity; and some is still made in the two latter provinces.

The celebrated Mr. FRANCIS WILLOUGHBY, who entered Spain from Roussillon, and travelled through great part of it in 1664, says, "at Cullura the wine first began to be sweet; and three leagues off, at Gandia, in Valencia, the plantations of sugar canes began. Quere, whether the nature of the soil, that was fit to nourish the sugar canes, did not also contribute to the nature of the grapes?"

"At Gandia we first found raisins of the sun, as they are called in England; in Spain they

they call this kind *panfas*, and they seem to be the *duracinæ* of the antients. They are all white, round, and have a tougher skin than other grapes. They gather them when fully ripe, and dip them in a boiling lixivium of water and ashes, just dipping them in, and taking them out again; and then dry them upon boards in the sun, taking them in by night, or in foul weather. The name raisin comes from *racemus*. Figs are dried just as they are gathered, not being dipped in any lixivium.

“ I went to Olives, in Valencia also, where, and at Gandia, are the engines for sugar-works; the best are at Olives. By the way we saw the sugar canes growing in several places. They are planted in low wet grounds, well mucked and dressed, divided into beds or hillocks, and furrows. They cut the canes close to the roots in November and December, and, cutting off the slender tops, which afford no good juice, keep them under ground till March, and then prick them into these hillocks or beds; out of every *talea*, or cut, shoot four, five, or six, canes, which will be ripe next December. The knots, or joints of the cane at the bottom are very close together, scarce an inch asunder; but upwards the distance is more, as
the

the cane grows slenderer. Within is a white pulp, or pith, full of sap sweet as honey. They sell them at Gandia to eat, and, cutting them in pieces just in the middle between two knots, suck the pieces at both ends. To make sugar, after the canes are cleansed from the tops and leaves, and cut to pieces, they are first bruised, either with a perpendicular stone running round, as apples to make cyder, or olives to make oil; or between two axes strongly capped with iron, horizontally placed, and turned contrary ways; and then pressed as grapes or olives are. The juice thus pressed out is boiled in three several cauldrons, one after another. In the third cauldron it becomes thick and black, and is then put into conical pots, which at the bottom have a little hole stopped only with coarse and foul sugar. These pots are covered when full with a cake of paste, made of a kind of earth called the Spanish *gritty*, and found near Olives, which is good to take spots out of clothes, which cap or cover sinks as the sugar sinks. These conical pots are put into other pots, into which, by the hole at the vertex, the juice drains down through the coarse sugar at the bottom. It drains for five or six months, in which time the sugar in the conical pots

grows hard, and white, all the juice being drunk up by the lute, or run out by the hole in the vertex. The juice is boiled again, so long as it is good for any thing; but at last it makes only a foul red sugar, that will never be better. The conical loaves of sugar, after they are taken out, are set to drain over the same pots for 14 or 15 days. To make the sugar more white, they must boil it again, but about one-sixth is lost every time. A pound of sugar of 12 ounces is sold at Olives for three *sous* and an half; refined, for five or six *sous*. The sugar juice is strained through strainers of linen, and is put out of one cauldron into another. They take it out of the first and second cauldrons so soon as it begins to boil; but in the third cauldron they let it boil till the scum rises, and then take off only the scum with the scummer, and put it into a long trough, to cool; and, when it is cool, put it into the conical pots. One scum rises after another in the third cauldron. The scum, when it is taken off, is white, but turns to a black liquor in the trough. They never refine the sugar more than three or four times. They use for the refining of it whites of eggs, putting in two or three dozen into a cauldron. They use but one cauldron for refining. When it is refined, it

grows

grows hard and white in nine or ten days. When they refine it, they put a little water into the cauldron, to dissolve it the better."

RAY's Travels, ed. 1737, vol. I. p. 409.

From Valencia, the cultivation of the sugar cane, and the manufacture of sugar, were carried in the beginning of the 15th century, by the Spaniards, to the Canary islands, and the commerce arising from the sugar there produced was considerable: but, prior to this period, the Portuguese, in 1420, carried the cane, and the manufacture of sugar, from the island of Sicily to Madeira. From these origins the cultivation of the sugar cane, and the art of making sugar, were extended by different nations of Europeans to the West Indian islands, and the Brazils.

The Canary islands, or *Insulæ Fortunatæ*, though known to the ancients, yet after the fall of the Roman empire, many centuries elapsed in which all intercourse, mention, and even knowledge of them, were buried in oblivion; and they remained as sunk from the world until about the year 1330, when a French vessel was forced on one of them in a violent gale of wind. After this accident they became known again in Europe.

The conquest of these islands was undertaken by the Spaniards in 1393. The Portuguese indeed had made some flight attempts in 1334; but, being repulsed at *Gomero* by the natives, they relinquished the enterprize.

The first of these islands that was conquered was *Lancerata* in 1400; *Fuerventura* was captured in 1405; *Canaria*, in 1483; *Palma*, in 1491; *Teneriff*, in 1495.

The island of *Madeira* is supposed, like the Canary islands, to have been known to the ancients; and, like them, to have been lost in the same interval of darkness, until the year 1344; when an English vessel was driven on this island by a storm. But this event was not succeeded by any intercourse with the island, and seems to have been forgotten, as no notice was taken of it until 1419, when it was again discovered by the Portuguese; who, in the following year, 1420, took possession of it. It was then a mere wilderness, as its name imports*, and unpeopled. The Portuguese burnt the woods, and made a settlement; and, in the same year, planted the sugar cane there, which they brought from the island of Sicily.

* *Madeira*. Nomen factum est à Lat. *materia*, quâ tam in vulgatâ Bibliorum versione quam alibi significatur idem quod Anglicè *timber*; quia tali materiâ abundabat ista insula. HYDII, not. in *Perisy. Itin.* p. 113.

From the incorrect accounts of the first West Indian discoveries, it is impossible to ascertain in which of the islands the cane was found, and in which it was not. We know it was seen in some of them : but, from modern navigators, we have proofs that it grows spontaneously in all the islands in the South Sea.

It was found in great abundance in all the Society islands, Easter island, and the Sandwich isles; where the Indians are perfectly acquainted with the use of its expressed juice, but have not the knowledge of making sugar.

Some plants of these canes have lately been introduced into the West Indies; and the astonishing increase of sugar, which those brought from Otaheite and planted in Jamaica yield over those of the island, shews, if there be not different species,—that vegetables, as well as animals, may degenerate, and require the impulse of change to incite, or re-animate their vigour.

Thus the breed of cattle, and thus also the improved husbandry in Europe in general, is carried on; grain, feeds, and plants, are removed from place to place, and varied, and cultivated, on physical principles, by philosophers.

In England, the Duke of BEDFORD, and Mr. COKE, have distinguished themselves in this kind of knowledge; and have rendered the most essential services to their country.

This should be a lesson to the planter of the sugar cane, not to continue propagating from the same stock; or at least to try the effects, where any degeneracy appears, of new plants from another island; or from remote parts of the same island, where the former cannot be obtained.

Whether there be different species of the sugar cane, or whether the varieties, with which we have been lately made acquainted, are owing to some local causes, has not yet been ascertained.

The French, a few years since, introduced into their West Indian islands plants from the East Indies. From their islands the cultivation of the East Indian cane has been carried into some of the English islands. Sir JOHN LAFOREY planted them in Antigua, and has proved their present superiority over the old canes of the West Indies. He gives the following account of these canes:

“ One sort brought from the island of Bourbon, reported by the French to be the growth of the coast of Malabar.

“ Another sort from the island of Otaheite.

“ Another sort from Batavia.

“ The two former are much alike, both in their appearance and growth; but that of Otaheite

Otaheite is said to make the finest sugar. They are much larger than those of our islands, the joints of some measuring eight or nine inches long, and six in circumference.

“ Their colour, and that of their leaves, also differs from ours.

“ They are ripe enough to grind, at the age of ten months.

“ They appear to stand the dry weather better than ours; and are not liable to be attacked by that destructive insect called the *borer*.

“ The Batavian canes are a deep purple on the outside; they grow short-jointed, and small in circumference: but bunch exceedingly, and vegetate so quick, that they spring up from the plant in one-third of the time which those of our island do*.”

The method of propagating the sugar cane is by cuttings from the top of it, and we know of no other method; though Mr. BRUCE says, in Abyssinia it is raised from the seed. Of this fact we have no example; and it is thought that Mr. BRUCE is mistaken in this matter.

* Sir John LAFOREY's remarks on the East Indian canes, imported into the French Charaibbean islands, in Mr. EDWARDS's preface to the second edition of his History of the West Indies.

The progress of cultivating the cane for the purposes of making sugar, has given rise to the erroneous supposition, that the migration of the sugar cane, under the Europeans, was from Sicily and Spain, to the Madeira and Canary islands; and afterwards to the West Indian islands, Mexico, Peru, and Brazil: and that it was not an original plant of those islands, and countries.

There is, besides, great difficulty in distinguishing, in the journals of voyagers, between the history of the plant and its produce. For, often when some particular period is mentioned, when the sugar cane was first carried to countries, the fact is, that such period was the time when the cultivation of the plant, for the purposes of making sugar, was introduced; which before was either entirely neglected, or the use of the simple juice only known: and frequently mention is made when sugar was first produced in some countries, which in reality was the period when the European art of refining it, or some improvements in its manufacture, was carried thither.

It is certain, that the sugar cane was found growing in the low, rich lands near the mouth of the Mississippi, when Europeans first went to that part of America.

Father

Father HENNEPIN says, "from thirty leagues below *Maroa*, down to the sea, the banks of the Mississippi are full of canes." This was in 1680, when he was there. He was the first European who explored the country adjacent to the lower parts of that river.

FRANCIS XIMENES, in his treatise on the plants of America, says, the sugar cane grows spontaneously near the *Rio della Plata*; this is also asserted by HERNANDES and PISO. This river was discovered in 1515, by JOHN DIAS DE SOLIS, a Spaniard; and the country about it conquered by PEDRO DE MENDOZA, in 1535.

JEAN DE LERY, who went in 1556 to the *Rio Janeiro*, in Brazil, says, he found every where near that river a great quantity of sugar canes; and it is certain that they could not have been planted by the Portuguese, as they were not settled in those parts until long afterwards.

JOHN DE LAET says, the island of St. Vincent produced the sugar cane spontaneously. *Lib. I. pag. 27.*

LABAT says, the first French settlers in St. Christopher, Martinique, and Guadaloupe, found sugar canes in different parts of those islands; which, growing there naturally, were afterwards properly cultivated, and have since produced

produced all the Sugar of those islands. Vol. II. p. 226.

The island of St. Christopher was first taken possession of by the French and English, on the same day, in the year 1625. The English made sugar there in 1643, and the French soon after. From this island the French sent a colony to take possession of Martinique; and they settled there in 1635.

In 1627, the English settled at Barbadoes; and, in 1643 made Sugar there. In 1676 it was in its most flourishing state, and employed four hundred sail of vessels, which were on an average of 150 tons*.

In 1628, the English settled at Nevis.

In 1632, the English settled at Montserrat; and, in the same year, the Dutch settled at St. Eustatia.

In 1635, the French settled at Guadaloupe; and, in 1648, made sugar there.

In 1650, the French settled at Granada.

Jamaica was discovered by COLUMBUS in 1494, in his second voyage; and bestowed on him by Ferdinand and Isabella, as some compensation for the acquisitions he had given to Spain in the West Indies.

* CHARLES II. in 1661, created thirteen Baronets of Barbadoes; each of whom had in the island not less than a thousand pounds a-year, and some ten thousand pounds a-year.

His son *James* settled, and planted it in 1509. What improvements it received by the Spaniards, during the time they were in possession of it, are but little known. They continued there however undisturbed until 1596; when Sir ANTHONY SHIRLEY, with a single man of war, took and plundered St. Jago de la Vega; which then consisted of 2000 houses. In the year 1635, this town was again plundered by 500 English from the Leeward islands. In 1656, on the 10th of May, the whole island was reduced, and taken possession of by the forces sent against it by OLIVER CROMWELL; and has since that time belonged to the English.

The sugar cane was first planted there, by the English, in 1660; and sugar first made in 1664. But some plantations were made there while it was in possession of the Spaniards, by ESQUINEL, a Spanish governor, under DIEGO COLUMBUS, son of the renowned COLUMBUS; who brought the plants from St. Domingue. There were in Jamaica, on the arrival of the English, only three small plantations in the island; the chief of which was at the *Angels*.

Sir THOMAS MODYFORD, a rich and eminent planter of Barbadoes, was the person who first planted and cultivated the sugar cane, for the purpose of making sugar, in Jamaica. This
was

was in 1660. He removed from Barbadoes to Jamaica, and carried with him much agricultural knowlege, to the great advantage of the island; which he contributed to improve and benefit, in a very extensive manner. CHARLES the second appointed him governor of the island in 1664: in which situation he continued until 1669.

In the island of St. Thomas, under the line, on the coast of Africa, which was discovered by the Portuguese in 1405, sugar was made much earlier than in the West Indies.

DAPPER says (page 491) that the Portuguese had sixty-one sugar works in this island, before the Dutch destroyed them in the year 1610.

HEYLIN, who published the first edition of his Cosmography in 1624, says "this island is so abundant in sugar canes, and well stored with sugars, that forty ships are hence loaded yearly with that one commodity; for making which they have here seventy *ingenios*, or sugar houses, and in each of them two hundred slaves, in some three hundred, which belong to the works. Six days in seven these slaves work for their masters, and the seventh for themselves, which they spend in sewing and planting their seeds, fruits, and provisions. They bring the negroes from the opposite continent, with

with whom the air agrees so well, that they attain generally to 110 years; few of the Portugals unto 50. The air is so vehemently hot that it suiteth not with the constitution of the Europeans."

LABAT, Vol. I. pag. 226. is decidedly of opinion, that the sugar cane is a native plant of the West Indies. But he says, that it is to the Portuguese and Spaniards that Europeans are indebted for the art of making sugar; who learned the secret from the inhabitants of the East Indies, and returning from thence put it in practice, first at the island of Madeira and the Canaries, and afterwards in the Brazils, and New Spain, about the end of the year 1580.

That the sugar cane is a native plant of the West Indies there can be no doubt; but in the other remarks, LABAT is mistaken, as has already appeared: for the Portuguese had not passed the Cape of Good Hope until 1497; long before which time sugar was made in the Mediterranean Islands. Besides, according to PETER MARTYR, in the year 1518, there were twenty-eight sugar-works in the island of Hispaniola, established by the Spaniards. He says, "it is a marvellous thing to consider how all things increase and prosper in this island. There are now twenty-eight sugar-presses, wherewith

wherewith great plenty of fugar is made. The canes or reeds wherein the fugar groweth are bigger and higher than in any other place ; and are as big as a man's wrist, and higher than the stature of a man by the half. This is more wonderful, that whereas in Valencia, in Spain, where a great quantity of Sugar is made yearly, whensoever they apply themselves to the great increase thereof, yet doth every root bring forth not past five, or six, or at the most seven, of those reeds ; whereas in Hispaniola one root beareth twenty, and oftentimes thirty*." English edit. 1577, page 172. The original edition was published in Spain, in 1530.

COLUMBUS, in his first voyage in 1492, discovered the island of Hispaniola, or Saint Domingue ; and ANTONIO HERRARA, in the second book of his second Decad, speaking of the improvements and cultivation carried to that island by the Jeronimite friers, says, " One AQUILON, an inhabitant of the great plain, carried thither, in the year 1506, some fugar canes from the Canaries, and planted them ; the same answering well, the fathers ordered that every inhabitant, who would erect a fugar mill, should have five hundred pieces of eight

* This justifies the supposition, that the fugar cane in the West Indies has degenerated. See page 21.

in gold lent him; and, by this contrivance, in a short space of time there came to be forty either Water or Horse sugar Mills in the island. It is to be observed, that formerly sugar grew only in Valencia, whence it was conveyed to Grenada, thence to the Canaries, and lastly to the Indies*, which made it more necessary to send over blacks; and that put the Portuguese upon carrying many from Guinea. Hispaniola proved so natural to the blacks, as to have it once said that, unless one happened to be hanged, none ever died†.”

In 1726, the French made in this island 33,000 hogsheads of sugar, of 12 hundred weight each. In 1742, they made 70,666 hogsheads; and, in the same year also, they made in Martinique, Guadaloupe, and the other lesser isles, 51,875 hogsheads.

The whole produce of the British West Indian Islands, imported into Great Britain that year, was 60,950 hogsheads. In 1770, St. Domingue yielded of sugar, two-thirds brown, 160,000 hogsheads, of 10 hundred weight each.

* This must refer only to the manufacturing of sugar. [Piso says the sugar canes were originally found growing wild in the woods in the Canary Islands. Lib. 4. Cap. 1.

† HERRERA says, the Spaniards first imported their negroes from the Portuguese, who had settlements on the coast of Africa.

GONZALEZ FERDINANDUS OVIEDUS, who lived in Hispaniola in 1515, and was governor of the city of *Sancta Maria* in Darien in 1522, says, p. 225 of the Summary of his General History of the West Indies, "there is such abundance of sugar in Mexico, that certain Spanish ships are yearly freighted therewith, and bring the same unto Seville, in Spain; from whence it is carried to all parts of Christendom."

As Mexico was not entirely conquered by the Spaniards until 1521, I think it is clear that the sugar cane must have been cultivated, and sugar made in Mexico, before the Spaniards went thither.

PETER CIEZA, who travelled from the year 1533 to 1550, in Peru, and other parts of South America, says, cap. 64, p. 167, "In several parts of the vales, near the city of St. Michael, there are large fields of sugar canes, whereof sugar is made in several towns and preserves."

He mentions this among other articles of the agriculture of the Indians, before the Spaniards went among them; for, though VASCO NUNEZ and BALBOA crossed to the South Sea, and settled at Panama in 1513, yet the Spaniards were never in any part of Peru, before the
the

the year 1525; and then PIZARRO, with a few adventurers, only landed, and made some discoveries, but returned to Spain in 1528, for authority to undertake the conquest of Peru; which was not begun in South America until 1530, and completed in 1532, by the murder of the last Inca, Atabalipa; or, as the Spaniards write the name, *Atahuallpa*: yet Spain was not in peaceable possession of Peru before 1554.

This immense scene of blood was not closed by the Spaniards, without many tragical events among themselves. ALMAGRO, the conqueror of Chili, was strangled before Cusco by HERNAND PIZARRO in 1538; and FRANCIS PIZARRO, the conqueror of Peru, was assassinated at Lima in 1541.

CIEZA mentions also the manner in which the Indians carry water in trenches, from the rivers descending from the mountains, through the fields in the plains; to supply the defect of rain in those countries.

This part of Peru was then inhabited entirely by Indians; for, though *St. Michael* was the first city built by the Spaniards in Peru, it was not founded until 1541, by PIZARRO, before the capture of *Atabalipa*; and, consequently, before the wars were ended, or that the Spaniards had turned their thoughts to agriculture.

D

Wherefore,

Wherefore, it is probable that the art of making sugar was known to the Peruvian Indians also, before the Spaniards went among them.

It is certain that GARCILASSO DE LA VEGA, who was a native of Peru, and left that country and went to Spain in the year 1560, says, in his Commentaries, lib. IX. cap. 28, part 1, that “ antiently there were no sugar canes in Peru, though now, by the industry of the Spaniards, and the fertility of the soil, they are increased to a loathsome plenty ; that, whereas formerly they were highly esteemed, and are now become of no value or estimation.”

“ The first Sugar Works in Peru were made in *Huanca*, by the contrivance of a gentleman with whom I was well acquainted. A servant of his, who was a subtle and ingenious person, observing the great quantities of sugar which were imported from Mexico, by reason of which the sugar of Peru would not sell to any account, advised his master to send one ship’s lading of his sugar to Mexico ; that they, seeing thereby the plenty of that commodity in Peru, might forbear to send any more thither. The project succeeded according to expectation ; and now sugar works are erected in many places in that country.”

JOSEPH

JOSEPH ACOSTA, who was in South America about the year 1580, says, in his Natural and Moral History of the Indies, lib. IV. cap. 32, “ that they not only use a great deal of sugar in the Indies, but also carry much into Spain ; for, the canes grow exceedingly well in many parts of the Indies. They have built their engines in the islands, in Mexico, in Peru, and in other parts ; which yieldeth the Spaniards a very great revenue.”

“ It was told me, that the engine for making sugar in *Nasca*, in Peru, was worth yearly above thirty thousand pieces of revenue. That of *Chicama*, joining to *Truxillo*, in the same country, was likewise of great revenue, and those of New Spain are of no less ; and it is strange to see what store they consume at the Indies. They brought from the island of *Saint Domingue* in the fleet wherein I came, 898 chests of sugar, which being, as I did see, shipped at *Porto Rico*, every chest, in my opinion, weighed eight *arobes*, every *arobes* weighing five and twenty pounds, which are two hundred weight of sugar. This is the chief revenue of these islands, so much are men given to sweet things.”

THOMAS GAGE, who went to New Spain in 1625, says (p. 236), in the voyage the Spanish

fleet, in which he was, touched at the island of *Guadaloupe*; “ where the Indians with great joy yearly expect the Spanish fleets; and by the moons reckon the months, and thereby guess at their coming; and some prepare sugar canes, others plantains, others turtles, some one provision, some another, to barter with the Spaniards for their small haberdashery, iron, knives, and such things which may help them in their wars, which commonly they make against some other Islands.”

This was ten years before any Europeans had settled there; and where no sugar was made until 1648, by the French, who then possessed it. The sugar cane, consequently, was the natural production of that Island.

GAGE says, cap. 15, “ two or three leagues from the Indian town of *Chiapa* there are (in 1626) two Ingenios or Farms of sugar, one belonging to the cloister of the Dominicans of the Spanish city of *Chiapa*, which is twelve leagues from this town, the other to the cloister of this town, which contain near two hundred Black-Moors, beside many Indians, who are employed in that constant work of making sugar for all the country.” He also remarks, in the same chapter, that sugar was an article of commerce, and sent from *Chiapa* down the
river

river *Tabasco*, to be transported to the Havannah. The towns of *Chiapa* are in the province of *Chiapa*, which joins to *Guatemala*.

The Portuguese first established Sugar Works in the Brazils, in 1580. They had no settlement of consequence there before 1549. The Dutch, after the truce between Spain and Holland in 1562, began their expeditions to the Brazils; and in 1637 they sent Count MAURICE thither. In 1641, when the treaty of peace was concluded between the Dutch and Portuguese, the former were in number 20,000, and had acquired seven of the fourteen captainships of Brazil. They had 60,000 negroes there, and made 25,000 chests of sugar. But, in 1655, they were dispossessed of their territories, and ceded them by treaty, in 1661, to the Portuguese; being reduced in number, by wars and other disasters, to only six or seven hundred persons. It was these Dutch fugitives, driven from the Brazils in 1655, that carried the art of planting the cane, and making sugar in a proper manner, to the West Indian Islands.

I have before observed, that the island of Barbadoes was first settled by the English in 1627, and sugar made there in 1643. I

shall now add some particulars from LIGON, which will illustrate the subject in a very satisfactory manner.

He says, in his History of Barbadoes, p. 85, " At the time we landed on this island, which was in the beginning of September, 1647, we were informed, partly by those planters we found there, and partly by our own observations, that the great work of sugar-making was but newly practised by the inhabitants there. Some of the most industrious men, having gotten plants from *Fernambrock*, a place in Brazil, and made trial of them at the Barbadoes, and finding them to grow, they planted more and more, as they grew and multiplied on the place, till they had such a considerable number as they were worth the while to set up a very small Ingenio, and so make trial what sugar could be made on that soil. But the secrets of the work being not well understood, the sugars they made were very inconsiderable, and little worth, for two or three years. But they, finding their errors by their daily practice, began a little to mend; and, by new directions from Brazil, sometimes by strangers, and now and then by their own people, who were content sometimes to make a voyage thither, to improve their knowledge
in

in a thing they so much desired. Being now much better able to make their queries, of the secrets of that mystery, by how much their often-failings had put them to often-stops and nonplusses in the work. And so returning with more plants, and better knowlege, they went on upon fresh hopes, but still short of what they should be more skilful in; for, at our first arrival, we found them ignorant in three main points that much conduced to the work; *viz.* the manner of planting; the time of gathering; and the right placing their coppers in their furnaces; as also the true way of covering their rollers with plates or bars of iron. At the time of our arrival there we found many sugar works set up, and at work: but yet the sugars they made were but bare Muscovadoes; and few of them merchantable commodities; so moist, and full of molasses, and so ill cured, as they were hardly worth bringing home to England. But about the time I left the island, which was in 1650, they were much bettered; for then they had skill to know when the canes were ripe, which was not till they were fifteen months old; and before they gathered them at twelve, which was a main disadvantage to the making good sugar; for, the liquor wanting of the sweet-

ness it ought to have, caused the sugars to be lean, and unfit to keep. Besides, they had grown greater proficient both in boiling and curing them, and had learnt the knowledge of making them white, such as you call lump-sugars here in England; but not so excellent as those they make in Brazil; nor is there any likelihood they can ever make such; the land there being better, and lying in a continent, must needs have constanter and steadier weather, and the air much drier and purer than it can be in so small an island as that of Barbadoes."

END OF PART THE FIRST.

SUGAR.

S U G A R.

PART THE SECOND.

Μελι καλαμινον.

Σακχαρον.

Saccaron.

Σακχαρι. Μελι καλαμινον.

Σακχαρ.

Αλς Ινδικος.

Saccharum.

Zuchar.

Zuccharo.

Açúcar.

Sucre.

Zúcker.

Suycker.

THEOPHRASTUS.

DIOSCORIDES.

PLINIUS.

ARRIANUS.

GALENUS.

P. ÆGINETA, *ab* ARCHIGENE.

Latinè.

Arabicè.

Italicè.

Hispanicè.

Gallicè.

Germanicè.

Belgicè.

HISTORY

(4)

THE

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HISTORY

OF

SUGAR.

SUGAR was first brought into Europe from Arabia and the East; and for many centuries was employed for medicinal purposes only. What kind or species of sugar this was, or whether any of the various preparations of it now in use, has been a subject of much controversy in antiquarian literature.

The profoundly learned SALMASIUS (SAUMAISE, his proper name), who went to reside at Leyden in 1632, asserts, that what authors denominate the *sacar mambu* of the Indians, was the *σακχαρον*, or sugar, of the ancients.

By the word ancients, in this treatise, the Greeks and Romans of the earlier periods are not meant. To them the word was unknown.

He

He says, — *Exercitationes nostræ docent illud σακχαρον esse quod hoc tempore vocatur apud Indos Sacar-Mambu; quod in arundine Indica arboreæ ac vastæ proceritatis sponte crescit. De Saccharo Commentarius.*

He also says, this *sacar-mambu* of the Indians was the *tabaxir* of the Arabians; but that the Arabians were ignorant how it was produced, as were the ancient Greeks of the *generatio Mellis Calamini*, sive σακχαρον; who thought it was the dew, which, falling on the Indian canes, concreted: and that it was a kind of manna.

The Arabians, he observes, supposed the *tabaxir* to be the ashes of the cane; and certainly, he says, this species of sugar, when concreted and coagulated, is like ashes; but, when issuing from the joints of the cane, it is white like starch. The antients remark also, that their sugar was brittle between the teeth; therefore many of them call it *Indian salt*; whereas our sugar, he says, melts in the mouth, and is not brittle*.

He contends, that the Arabians were in an error respecting their *tabaxir*; and that it was not the ashes of the cane, but the *sacar-mambu*

* *Exercitationes Plinianæ.*

of the Indians, and the real *μελι καλαμινον* of the Greeks. He says the antients gave it the appellation of *fugar*, which the Arabians did not; because they believed it to be the ashes, and not a species of *fugar* which was called by them *zuchar*.

He says the cane, from which the fictitious *fugar* now in use is made, is a small plant; but that in the Indies, which yields the *facar-mambu* of the Indians, the *tabaxir* of the Arabians, or native *fugar* of the antients, is a large tree; and that this species of *fugar* is the concreted exudation from the tree, found about the joints.

SALMASIUS at length attempts, as a farther corroboration of his opinion, to shew, that the virtues attributed by the Arabians to the *tabaxir*, coincide with those which the Greeks ascribed to their *σακχαρον*.

In these conjectures, I believe, it will appear that the most learned SALMASIUS is mistaken; and that the *tabaxir*, or, as it has been variously rendered by translators, *thabafir*, *tarathit*, *sataiscir*, *tabasis*, *tabafir*, and *fabascir*, of RHASIS, AVICENNA, SERAPION, and AVERROES, was neither the *facar-mambu* of the Indians, nor the *σακχαρον* of the antients.

Let

Let us examine what may be collected from the Arabians themselves, concerning their *tabaxir*.

RHASES (anno 930) says, —

Tarathbit, id est Spodium, frigida est & sicca, quæ & ventrem stringit, & sanguinem exire prohibet. Spodium frigidum est & siccum, quod febribus acutis, ac siti, & nimio ventris fluxui, & vomitui, confert; pustulis quoque quæ in ore & lingua nascuntur, atque tremori cordis, auxiliatur. De Simplicibus, cap. 36.

AVICENNA (anno 1040) says, — *Thabasir* (the translator calls it *Spodium*) *quid est? Cannarum adustæ; dicitur enim quod ipsæ aduruntur propter frictionem suarum extremitatum, quum ventus eas perflat. Frigidum est in secundo, & siccum in tertio. In ipso est stipticitas, & præparatio & parum resolutionis, & ejus infrigidatio est plurima, & ejus resolutio est propter amaritudinem paucam in ipso. Ex resolutione igitur ejus, & stipticitate, fit exsiccatio fortis, & est compositarum virtutum sicut rosa. Confert apthis, & melancholiæ provenienti solitudine. Spodium (Tabaxir) confert apostematibus oculi calidis, confortat cor, et confert tremori ejus calido, & syncopi factæ ex effusione cholæræ ad stomachum, & bibitum, & linitum, & confert melancholiæ ex solitudine, &*
timori

timori de præteritis, & terrori de futuris. Confert tussi (siti) & inflammationi stomachi, & debilitati ejus, & prohibet effusionem cholerae ad ipsum, & confert conturbationi. Prohibet solutionem cholericam. Confert febribus acutis. Lib. II. Tract. 2. Cap. 617. Ed. Venetiis, 1564.

SERAPION (anno 1070) says, adducing his authorities, —

Sataiscir, vel Rescius, id est Spodium.

BEDIGORES, — *Proprietatis spodii est, quod confert caliditati cholerae.*

RHASES, ex verbo GALENI, — *In spodio est resolutio, & prohibitio, & repercussio, & infrigidatio, sed infrigidatio ejus est fortior, & in sapore ejus est amaritudo, & stipticitas, & propter hoc desiccatur. Et jam est declaratum, quod in spodio est virtus composita, sicut rosa, & non est in spodio tantum stipticitas, quantum in rosa.*

DIOSCORIDES, — *Spodium confert apostematibus calidis oculorum.*

MESEAH, — *Spodium est frigidum in tertio gradu, siccum in secundo, confert inflationi cholerae, & fortificat stomachum, & confert ulceribus oris.*

MESARUGIE, — *est bonum cholerae, & syncopi, et bother (pustulis) factis in ore puerorum.*

RHASES

RHASES, — *Spodium est frigidum et siccum in tertio gradu, stringit ventrem, et confert ulceribus oris, et inflationi cholerae, et fortificat stomachum, et confert syncopi, et cardiacae calidae quando datur in potu ex eo, et confert bother (pustulis) frigidis in ore infantium.* De Temperamentis Simplicium, Cap. 332.

AVERROES, (anno 1198) says,

Tabaisis, id est spodium, carbo est nodorum arundinum adustarum Indiae: frigidum est & siccum in tertio gradu, et ejus proprietas est remove caliditatem et inflammationem cholerae, et confortat stomachum, et confert cardiacae calidae. De Simplicibus, Cap. 56.

Now it is evident, from the testimony of the preceding authors, that the Arabians ascribed no property whatever to their *tabaxir*, that is any way applicable to sugar. The great feature of its character, *sweetness*, is not once mentioned.

The translators, as their originals before them, had considered the *tabaxir*, to be the ashes of the Indian canes; or of their joints, or roots: and being of a greyish colour, like *spodium*, (*pompholix*, *tutty*, *putty*) rendered the word *tabaxir*, by that appellation, from σπῶδος, ashes. But as it was given internally, it certainly

tainly could not be the *σποδος* of the Greeks ; which was the fordes, or recrement of melting brafs : and never employed by them but for external purpofes.

SALMASIUS, whose great erudition and extensive knowledge, have been the admiration of the learned in every country, never felected a fubject for his animadverfions, with which he appears to have been fo little acquainted as the prefent. He conceals, beneath a dazzling difplay of learning, the imperfect knowledge he had of the hiftory of fugar : taken chiefly from uninformed travellers, and particularly from GARCÍAS ab *Orta*, in refpect to the *tabaxir*.

GARCÍAS, who was a Portuguefe phyfician, and lived at Goa in the Eaft Indies, in 1563, fays “ the *tabaxir* of the Arabians, rendered *fpodium* by their interpreters, is not the fpodium of the Greeks : which is a metallic preparation, and never given internally. They differ as much as black from white ; and that the fpodium of the Greeks, is the *tutty* of the Arabians.”

He fays that “ *tabaxir* is a Perfian word, which AVICENNA and other Arabian writers took from the Perfian language ; and that it implies, *lactens humor, aut succus liquorve alicubi*

concretus: by which name this medicine is known to the Arabians and Turks."

He says "the Indians call it *sacar-mambu*, that is, the sugar of the *mambu*; because the Indian canes, or trees, the branches of which produce it, are so called. But that they now call it *tabaxir* also; as by that name it is sent for from Arabia, Persia, and Turkey, and is imported, as an article of commerce, into those countries from India."

He says "the *tabaxir* is a very dear medicine in Arabia, and sells for its weight in silver."

The tree which produces it, he says, "is sometimes as large as a poplar tree; sometimes smaller; the branches generally grow erect (unless when bent for bowers and shady walks, customary among the Indians), with knots, the length of the hand asunder; with a leaf resembling the Olive leaf, but longer. Between each of the joints, a sweetish liquor is generated, thick like starch, and like it in whiteness; sometimes much, but sometimes very little. All the canes, or branches, do not contain this liquor, but only those which grow in Bijnager, Batecala, and part of the province of Malabar."

This

This liquor when concreted is sometimes found blackish, or of a grey colour, but it is not the worse on that account; because it arises from too great humidity, or that it has been retained too long in the wood, which makes it of this colour; but not from the burning of the tree, as some have supposed."

He then recites the opinion of RHASES, respecting the virtues of the *tabaxir*, and observes that in the latin version of SERAPION, it has been corruptly rendered *sataiscir*. He says "it is evident from what is stated, that AVICENNA was mistaken in supposing the *tabaxir* to be the ashes of the roots of the canes."

He says also, as a further proof of the *tabaxir* and *spodium* having been erroneously confounded together, "that *spodium* was not used internally by the Greeks; and that, by the testimony of the Indian, Arabian, Persian, and Turkish physicians, the *tabaxir* is used not only in external, but in internal inflammations; and also in bilious fevers and dysenteries." *Historia Aromatum, Lib. I. Cap. 12.*

Priso, a Dutch physician, who lived in the Brasils in the beginning of the last century, says, "in Egypt the *sacar* of the Arabians, from whence our word sugar is derived, is

produced from a low and little plant, coagulated by the heat of the sun; but, in the East Indies, from the *mambu reed tree*, (he then refers to GARCÍAS, whom he little more than copies in the whole article,) which is full of joints, and in size as large as the poplar tree. The *sacar-mambu*, which the Arabians call *tabaxir*, issues from this tree, a viscid whitish liquor, according to RHAZES, AVICENNA, and SERAPION." *Hist. Nat. & Med. Lib. IV. Cap. 1.*

He says, in another place, that "there are in the uncultivated regions of the Indies two species of canes, called *Mambu*; or, as the Portuguese have corrupted the word into, *Bambu*. One sort is small and full of pith; and the other large, and more hollow: for which reason they have been called by writers sometimes canes, and sometimes trees."

He then gives an account, not much deviating from GARCÍAS, concerning the uses, and other particulars, of the *Bambu* cane; observing, "that there are some so large, that the Indians make canoes of them, capable of carrying two people."

He says, "the full-grown *Mambu* canes have a soft, spongy, liquid, medullary substance, which

which the common people suck with avidity, on account of its grateful taste."

"When these canes are large and old, the liquor which they contain changes in colour, taste, and efficacy, and gradually protrudes through the cane, between the joints, and is coagulated by the heat of the sun, and hardens like white *pumice* stone, and soon loses its native agreeableness of flavour, and acquires a taste something like burnt ivory, and is called by the Indians *sacar-mambu*. The lighter, whiter, and smoother it is, the more it is esteemed; and the more cineritious it is in colour and unequal in figure, the worse."

"It is held in estimation by the Indian, Arabian, Moorish, Persian, and Turkish physicians, for external and internal heats and inflammations, and bilious dysenteries; and the Indians use it in stranguries, gonorrhœas, and hemorrhages."

"The word *tabaxir* is taken from the Persian language, and signifies *lac lapidescens*, which some credulous Arabians and Turks thought to be the ashes of canes, burnt by the friction produced by the wind blowing them together. This error has been propagated by the Latin interpreters of the Arabians, rendering *tabaxir*, *spodium*; because in taste and appearance it

somewhat resembles burnt ivory or hartshorn. But, as GARCÍAS observes, *spodium*, or *tutty*, is used only externally in the compositions of the Greeks; and *sacar-mambu*, or *tabaxir*, is generally used in the compositions of the Arabians, for internal purposes."

"The Indians have used the word *Sacar* in their language for this concreted juice, not on account of any sweetness in it, for many centuries. In after-times, when the art of making sugar from the expressed juice of the sugarcane was known, that factitious substance received the appellation of *saccharum*, or sugar: probably deriving its etymology from the *sacar* of the Indians." *Mantiss. Aromat. cap. 10.*

He makes many other remarks, chiefly copied from GARCÍAS and SALMASIUS.

I think it is evident, from the authors above cited, that, supposing the *sacar mambu* of the Indians were the *tabaxir* of the Arabians, it is impossible it could be the *saccharum* of the ancients.

It is also unnecessary to contend that the *sacar mambu* of the Indians was not the *tabaxir* of the Arabians; for it appears to me that neither GARCÍAS, nor his follower PISO, were positive, from their own knowledge, what the *sacar-mambu* is,

It

It is certain that the *sacar-mambu* is not sweet, according to their account, and consequently cannot have any relation to sugar : and if it be the exuded gummous juice of the *mambu*, or, as we call it, the *bambu-cane*, it could not be sweet, for that tree contains no saccharine juice. How then could this be the sugar of the ancients ?

The Arabians had their *tabaxir* from India. Their account of it is fabulous. Yet they all agree that it was the ashes of the Indian cane : and whether it was a kind of pot-ash, or any other saline preparation, from vegetable excineration, we cannot determine from any chemical or medical facts they have left us on the subject. Certain it is, there is no *sweetness* attributed to it, and consequently it could not be sugar ; and, as it was given internally, whatever resemblance it might have to *spodium*, it has no right to that interpretation ; as the *spodium* of the Greeks, as already observed, was a metallic preparation, and never used internally.

The Arabian medical writers were chiefly compilers and copiers from the Greeks ; and seem to have known but little, even of their own country. Their account of *manna* is as fabulous as that of their *tabaxir*, and has given rise to as many speculations. They sup-

posed it was a dew, attracted by certain trees, plants, and stones, and there concreted.

AVICENNA denominates manna, a species of sugar, *zuccarum albusar*; which, he says, falls on the plant *albusar*, or *alboffar*, and is there collected in lumps, like salt.

Zuccarum Albusar quid est? Manna; cadens super albusar, et est sicut frusta salis. Lib. II. Tract. II. Cap. 756.

SERAPION, *Cap. 45. de Temperamentis Simplicium*, speaking of *men*, or *manna*, says, from RHASES, when it first falls on the leaves of the trees, it is like honey, but green, which, by remaining there for some time, becomes white. He says also, from MESCHA, that its qualities depend on the nature of the trees on which it falls. He has another species of manna, *Cap. 41.* which he calls *tereniabin*,—*mel roris*, and which he says, from EBENAM-REZ, falls on trees with thorns, in the East.

The Arabian writers were all unacquainted with the real nature of manna, in supposing it to be dew, instead of the inspissated juice of trees.

RHAZES says, *Cap. 20. de Simplicibus*,—*teroniabin* is hot, purges the bowels, and assuages the throat.

Indeed,

Indeed, AVERROES himself, in some measure, accounts for their being unacquainted with it, by saying, it was not the produce of their own country. —

Terregebim, id est manna, provenit à partibus superioribus Syriæ, vel Indiæ. Cap. 55. Simplicia.

However, a different inference may be drawn from AVICENNA, who says, there are two sorts of manna, and both the produce of Arabia. The white sort from *Iamen*, or *Yemen*; and the dark sort from *Agizium*, or *Hagiaz*. The former of these places is in Arabia Felix, and the latter in Arabia Deserta; —

Aliud est Iamenum, album; et aliud est Agizium, ad nigridinem declinans.

Lib. II. Tract. II. Cap. 756.

AVICENNA mentions a sugar, which is found on canes, like salt:—

Illud saccharum, quod super arundinem invenitur, sicut sal. De Zuccaro, Lib. II. Tract. 2. Cap. 755.

SALMASIUS, believing in this error, that sugar was actually found ready made, asserts, —

De hoc ipso priscorum saccharo, sive tabaxir, accepi debet; cui nomen etiam propterea αλος Ινδικου veteres imposuerunt. De Canteo, cap. 79.

“ This

“ This is the fugar of the ancients, to which they also gave the name of *Indian Salt* ; it is also the *tabaxir* of the Arabians.”

I have already shewn that this was not fugar, or any saccharine substance.

I have not given the Latin versions of the Arabian writers in English, for reasons obvious to the learned.

What seems to have strengthened SALMASIUS in this error is, that the fugar described by the ancients does not correspond with any species of fugar now in use. His own words are,—

Fallitur itaque mirum in modum si quis μελι καλαμινον, aut αλας Ινδικον, aut σακχαρον antiquum idem putat cum nostro saccharo. De Saccharo Comment.

It may now be proper to see what the ancients have left on record relative to our subject, in order to ascertain what evidence may be obtained from their writings, by which we may decide on the suppositions and opinions which have been advanced ; and I apprehend it will appear, that the fugar known to the ancients was neither the *saccar-mambu* of the Indians, nor the *tabaxir* of the Arabians, nor, as many have imagined, *manna*.

Diosco-

DIOSCORIDES (*anno* 64), who is the first writer which mentions the word σακχαρον, or sugar, in his chapter περὶ Σακχαρου Μελιτος, demonstrates clearly that he was acquainted with some species of sugar, made from the sugar cane; though it plainly appears that he was ignorant of the nature of its preparation.—

Καλεῖται δὲ τι καὶ σακχαρον εἶδος οὐ μελιτος, ἐν Ἰνδία ὑπεπηγοτος καὶ τῇ εὐδαιμονίᾳ Ἀραβία· εὐρισκόμενον ἐπὶ τῶν καλάμων, ὁμοίον τῇ συστασει ἀλίσσι, καὶ θραυόμενον ὑπὸ τοῖς ὀδοῦσι καθάπερ οἱ ἀλῆς.

“ There is a sort of concreted honey, which is called sugar, found upon canes, in India and Arabia Felix: it is in consistence like salt, and it is brittle between the teeth like salt.”

PLINY says, —

Saccaron & Arabia fert, sed laudatius India. Est autem mel in harundinibus collectum, gummi-um modo, candidum, dentibus fragile; amplissimum nucis avellanæ magnitudine: ad medicinæ tantum usum. Hist. Nat. lib. XII. cap. 8.

“ Sugar is brought from Arabia, but the best sort from India. It is honey collected from canes, like a gum, white, and brittle between

tween the teeth ; the largest is of the size of an hazle nut : it is used in medicine only.”

ARRIAN (*anno* 123), in *Periplo maris Erythraei*, says, there is a nation bordering on the Red Sea, who drink, μελι το καλαμινον, το λεγομενον σακχαρι;—“honey of the reed, called fugar.”

GALEN (*anno* 164), in his 7th book of the temperaments and faculties of simple medicines, περι Μελιτος, says,—

Και το σακχαρ δε καλουμενον οπερ εξ Ινδιας τε και της ευδαιμονος Αραβιας κομιζεται περιπηγνυται μεν, ως φασι, καλαμοις, εστι δε τι και αυτο μελιτος ειδος· ητλον μεν ουν εστιν, η το παρ ημιν γλυκυ.

“Sugar, as they call it, which is brought from India and Arabia Felix, concretes, as they say, about the canes, and is a species of honey : it is less sweet than our honey.”

PAULUS ÆGINETA (*anno* 670), the last of the Greek writers on medicine, *lib.* II. *cap.* 54. says, from ARCHIGENES, who lived *anno* 117,—

Αλς ο Ινδικος, χροια μεν και συστασει, ομοιος
τω κοινω αλι, γευσει δε μελιτωδης.

“The *Indian salt*, in colour and form like common salt, but in taste and sweetness like honey.”

In *lib. VII. cap. 3*, he says, “Honey is of an heating and drying nature in the second degree, and is abundantly cleansing. Boiled, it is less acrid and deterfive, and opens the bowels, but is more nutritious: but the bitter honey, such as comes from Sardonias, has the mixed property of being earthy and hot. The *other sugar*, which is brought from Arabia Felix, is less sweet than that which we have; but it has equal virtues, and is neither hurtful to the stomach, nor excites thirst like our honey.”

It is true that DIOSCORIDES, PLINY, GALEN, and P. ÆGINETA, all mention that sugar came from Arabia as well as from India; but it is certain that the sugar described by them to be “white like salt, and brittle between the teeth, and sweet like honey,” was brought from India into Arabia; and was not the produce of Arabia; and this is proved by what follows.

AVICENNA recommends, from ARCHIGENES, as quoted by P. ÆGINETA, when the tongue is
dry

dry and parched in fevers, to cleanse it with oil of almonds and white sugar; and that the sick should have in his mouth a lump of “the salt that is brought from India; which in colour is like salt, and in sweetness like honey.”—

“*Sal, qui asportatur de India, & in colore salis, & dulcidine mellis.*” De Asperitate Linguæ, lib. IV. fen. 1. tr. 2. cap. 22.

Here we have, I think, decidedly the sugar of the ancients.

This can be no other preparation than that we now call white SUGAR-CANDY; which I consider as the real *μελι καλαμινον : αλς Ινδικος : —σακχαρον antiquorum.*

It is evident AVICENNA erroneously supposed this saccharine preparation as a natural, and not as an artificial production; when, speaking of the different sorts, or rather coloured sugars, he compares it in appearance to salt; and says it is found on canes, in the passage before mentioned.

In different parts of this treatise, I have selected from the Arabians every thing they have said pertaining to the subject; but there is such a want of discrimination among the Arabian writers, which their editors, translators, and commentators, have further perplexed with various

various texts, interpretations, and conjectures, that it is impossible to know exactly the precise distinctions, intended by the original authors, in their different appellations of *honey*, *manna*, and *sugar*.

However, the sugar cane is unquestionably a native plant of some parts of Arabia; and, though the art of evaporating its juice for the purpose of making a common, coarse, or muscovado sugar, was known long before AVICENNA's time; yet I cannot suppose, a thousand years prior to his time, that the sugar of the ancients, being sugar-candy, was made in Arabia; especially as AVICENNA himself, if we admit the *salt* he mentions to be the same, says it was brought to Arabia from India.

Yet PLINY is very particular, in observing that the Indian sugar was superior in quality to the Arabian; which shews, that some of the sugar known to the Romans in his time must have been brought from Arabia, if not manufactured there.

Besides, we know that there is no such thing as sugar found on canes; and, so far from the juice of the cane issuing from the plant, and concreting like gummos or vegetable resinous juices, the plant decays on being wounded; and, without

without being wounded, the juice never escapes from its stem.

Every kind of sugar whatever is made by art. Native sugar never existed. Ignorant people, even at this day, in our own part of the world, imagine that sugar is found, like pith, in the hollow of the canes; in the state in which it is brought to Europe.

The crystalline appearance of sugar-candy, and its fragility between the teeth, might naturally lead the ancient writers to give it the appellation of *salt*; and, from its sweetness, that of *honey* of the *reed*; as honey was their standard of sweetness.

It was also very natural, for people who knew nothing of the process of making sugar, that they should consider it, being a vegetable production, as a gum; and, like other gums, to be the exudations of some plant, or tree, concreted by the heat of the sun.

There can be no doubt but that the sugar of the ancients, and that species of sugar described by the Arabians as resembling salt, with the sweetness of honey, were the same identical article; and as in the writing of the ancients there is only one sort of sugar mentioned, and though that sugar is said by some of them to have been brought from Arabia,

as

as well as from India, yet the Arabians themselves mention it as brought from India only ; and there is every reason to believe, at that period, that the art of chrySTALLIZING the juice of cane was known only in India.

Indeed, sugar must have been better known in Greece and in Italy, from their contiguity to Arabia, had it then been manufactured in that country. Besides, there is no mention among the antients of any kind of sweet canes or reeds, but what were particularly said to have grown in India.

As it is certain that sugar was brought from India at the time when mention was first made of it, it is proper to enquire whether it was manufactured in India only ; and what sort of sugar was made in India in those times ; or at least to draw the best inference we can from what we know of the history of the commerce of sugar, and the manufacture of it in the East Indies, at this time.

There have ever been, since our knowledge of the East, two sorts of sugar made there ; raw or muscovado sugar, and sugar-candy ; the first used only for culinary purposes, and the latter for every other purpose of diet, luxury, and exportation.

F

The

The art of refining sugar, and making what is called loaf-sugar, is a modern European invention, the discovery of a Venetian about the end of the 15th, or beginning of the 16th century; and not practised in India until very lately.

China boasts, and not without reason, of the antiquity of her arts and policy over the rest of the East; as well as over the rest of the world. The sugar cane is indigenous to China. The climate and soil in many parts of Bengal, and other districts of the East Indies, are also suitable to the growth and cultivation of the cane; and sugar is, and we have reason to suppose ever has been, produced there. Nevertheless, China is the only country in the East, even now, where sugar-candy is made in perfection.

The bright, transparent sugar-candy, so beautiful in appearance, and so grateful to the taste, is a peculiar manufacture, and was originally invented in China.

It is exported from China to every part of India, and even to many countries there, where abundance of sugar is made.

Du HALDE says, the sugar of China constitutes a great trade to Japan; and that when ships go directly from Canton to Japan, the
sugar-

sugar-candy so transported yields a profit of a thousand per cent.

The Chinese, and all the nations of the East, set no estimation on any other sugar than sugar-candy. They use it in tea, coffee, and all other beverages ; and this preference, no doubt, arises from judgement, as the fine sugar-candy is incomparably the most delicious sweet in the world. This may account for the art of refining sugar into loaf-sugar never having been practised in the East.

In the ancient, steady, and unchangeable empire of China, arts existed, while Europe was in a state of barbarism ; arts, which are still the admiration of mankind : and it is probable that this mode of preparing sugar, so well calculated for carriage and preservation, was practised by the Chinese, and was an article of commerce among them, in much earlier ages than are comprehended in European traditions ; which they consider but as the records of yesterday.

In respect to the derivation of the word *candy*, and when this adjunctive appellation was first used, to distinguish *sugar-candy* from other species of sugar, various have been the opinions of the learned.

Some suppose it had its origin from the island of Candia (Crete) ;—others, from Gandia, a town in Valencia, in which province sugar was first made in Spain * ;—others, from the Arabic *elkende*—*elkendit*, which simply signify sugar ;—and others, from the Latin *candidum* (*à candore*), bright, shining, white.

SALMASIUS derives it from a corrupt Greek word of the middle ages. He says,—

“*Saccharum candum, non à candore dictum, nec à canna; sed καψί, vel καψιον, & καψιον, Græci recentiores vocârunt, quod angulosum sit; & quum frangitur, in partes semper diffiliat angulatas. Id Græci vulgares καψιον appellant.*” Plin. Excert. p. 718.

But this is by no means satisfactory ; for, if sugar-candy had this appellation from its angular figure, entire, or broken, the word should be written *cantum*, or *cantium*, in the Latin ; or rather *canthum*, or *canthium* ; as *καυθος* is *angulus*, an angle or corner.

SALMASIUS has taken this barbarous word from NICHOLAS MYREPSUS, who wrote his collection of *formulae*, from the Greek and Arabian

* See page 15.

authors, about the year 1280: he is one of the latest writers in the Greek language. His writings are full of barbarisms, and *καυλιον* is found used by him, *De Antidotis*, cap. 35, 94, and 96, to express what the translators have rendered, "*saccharum appellatum candum*;"—the sugar-candy of the moderns.

FUCHSIUS, one of his translators, observes, in the notes to cap. 35, and 94, that though the word is *καυλιον* in the manuscript copy, and implies what we now call *saccharum candi*, *vel candidum*, yet it seems to have been written originally *καυδιον*;—and that *candi* is only an abbreviation of *candidum*.

Now *καυδιον*, I believe, stands on no better authority in the Greek language than *καυλιον*; and I think it is difficult to ascertain whether the word be a corruption of the Greek *καυθος*, or the Latin *candidum*, considering the period when MYREPSUS wrote.

However, I am not inclined to give my suffrage to any of the preceding etymons.

May it not be from the Indian word *khand*, which is a general appellation for sugar in Hindostan? Sugar-candy is there called *mifree*; white sugar, *chinny*; a composition they make of sugar and roses, *goolkund*; a drink made of the same materials, *goolchukeree*; the

inspissated juice of the cane, *kund-seah*, or *jaggery*.

Shukur also is a general appellation for sugar; from which, and the word *kband*, it appears to me, that the others are compounded.

From *shukur*, the Indian origin, it is most probable that the word sugar is derived; from thence the Arabians had it; and it has undergone but little variation since, in European languages. And, though these particulars do not seem to have been known to the learned philologist, SKINNER, he was certainly right in his conjecture;—*vox (sugar) procul dubio, ab Indis Barbaricis, cum re translata*.

To conclude this part of my subject, I think there can be no doubt but that sugar-candy was the first and only species of sugar known to the European antients, and that it was the original manufacture of the East, particularly of China, the most ancient of the Eastern nations; and found its way into Europe, as we are certain raw sugars did in after-ages, when first known to Europeans, by the way of India, Arabia, and the Red Sea; several centuries before MYREPSUS lived.

The Venetians, anterior to the year 1148, imported considerable quantities of sugar from India by the Red Sea, and also from Egypt.

Sugar

Sugar was likewise made before that time in the Island of Sicily. With the produce of this island, and the sugar imported from India and Egypt, the Venetians carried on a great traffic, and supplied all the markets of Europe with this commodity *.

Indeed, the Venetian history informs us, that even prior to 991, when ORSEOLO was Doge of Venice, the Venetians, then forcing their commerce with the Saracens into Syria and Egypt, brought back from thence in return, not only rice, dates, senna, cassia, flax, &c. but also sugar †.

This shews how much WOTTON was mistaken, when he asserted, that "all the arts and methods of preparing sugar, which have made it so very useful to human life, are owing to the modern Portuguese and English ‡."

DOCTOR WILLIAM DOUGLAS, of Boston in America, was also mistaken, when, remarking that "the ancient Greeks and Romans used honey only for sweetening, and that sugar was not known amongst them," he asserts that "PAULUS ÆGINETA is the first who expressly mentions sugar §."

* *Essai de l'Histoire du Commerce de Venise*, p. 100.

† *Ibid.* p. 71.

‡ *Reflexions upon Ancient and Modern Learning*.

§ *Summary Historical and Political*, Vol. I. p. 115. Anno 1760.

DoCTOR CAMPBELL was likewise erroneous when he asserted, that “ the sugar-canes were certainly known to the ancients, though what we call sugar was not; for, manufacturing the sweet juice of the sugar-cane into that form was the invention of the Arabians, who bestowed upon it the name it bears, calling it in their own language *succar* *.”

The art of refining sugar was first practised in England in 1544. The first adventurers in this business were *Cornelius Bussine*, *Ferdinando Points*, ... *Mounsie*, *John Gardiner*, and *Sir William Chester*; these persons were the proprietors of two sugar-houses, which were all that were at that time in England.

The profits arising from this concern were at first but very inconsiderable; as the sugar-bakers at Antwerp supplied the London market at a cheaper rate than what the English sugar-bakers could. After the intercourse between England and Antwerp was stopped, these two sugar-houses supplied all England, for the space of twenty years; and greatly enriched the proprietors. This success induced many others to embark in the same trade; a number of sugar-houses were established, and many persons failed, and became bankrupts.

* Considerations on the Sugar Trade, p. 5. Anno 1762.

In 1596, Sir *Thomas Mildmay*, on the pretext that frauds were practised in refining sugar, petitioned queen Elizabeth for a licence, for an exclusive right to refine sugars, for a term of years; for which monopoly he offered to pay an annual sum. His petition however was rejected: and England, which formerly had been supplied with refined sugar from Antwerp, the chief commercial city then in Europe, now not only supplied itself, but exported great quantities to other countries.

Sugar was taxed by name in England, 2 James II. cap. 4.; prior to that time, it paid twelve pence per pound, or five per cent. poundage, as then was the case with all other imported goods.

END OF PART THE SECOND.

1

THE HISTORY OF THE
CITY OF LONDON
FROM THE FOUNDATION
TO THE PRESENT TIME

BY JOHN STOW

THE SECOND EDITION

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ON THE
 PROPERTIES AND USE
 OF
 SUGAR.

PART THE THIRD.

SUGAR, when first introduced into every country, was used only medicinally. PLINY leaves no room for doubt on this point. Even in Arabia, in AVICENNA's time, though sugar was an article of commerce from the East, there is no record of its being used in dietetic, or culinary purposes, for several centuries afterwards.

Sugar was employed originally to render unpleasant and nauseating medicines grateful to the sick: and in pharmacy, in syrups, electuaries, confections, and conserves.

ACTU-

ACTUARIUS was the first physician who substituted sugar for honey in medicinal compositions *.

It is not to be supposed, however, that such a delicious and innocent article could longer be subject to the controul of the physician, and confined to the apothecary's shop, than while the quantity obtainable was insufficient for the purposes of luxury ; and the price too great to be admitted, by the generality of mankind, as an ingredient in their food.

As there are but few of the ancients who have even mentioned sugar, it is not difficult to collect all that has been said of it by them, as to its use. It appears nevertheless, that it was preferred in their days to honey in medicine.

I have said that ACTUARIUS was the first physician who used sugar, instead of honey, in prescriptions ; because he is supposed, by me, to have written *anno* 1000 ; which was before MYREPSUS made his compilation ; though some writers place ACTUARIUS three centuries

* De Pulmonis et cæteris Thoracis Vitiis, Lib. IV. cap. 4. Lib. V. cap. 1. cap. 2. cap. 4. cap. 5. cap. 8. He likewise mentions the sugar called *penidii*, lib. V. cap. 6 and 9.—this *penidii*, or *penidium saccharum*, is denominated by the Greek Writers *πενιδία*.

It is thought to have been a preparation of sugar, like what we call barley-sugar.

(anno 1300) after that period, and subsequent to MYREPSUS.

DIOSCORIDES, who is the first that mentions sugar by name, *σακχαρον*, from which the Latin *saccharum* is derived, is also the first who speaks of the medicinal qualities of sugar. In his chapter, *περι Σακχαρου Μελιτος*, he says:—

Εστι δε ευκοιλιον, ευστομαχον, διεθεν υδατι και ποθεν ωφελουν κυστιν κεκακωμενην και νεφρους· καθαιρει δε και τα τας κορας επισκο τουνηα επιχρισιμενον.

“ It opens the bowels, and is good for the stomach, when drunk dissolved in water: it relieves pains in the bladder and kidneys: and dissolves those films which grow over the pupil of the eye, and cause a cloudiness in the sight.”

The latter part of this passage implies the external application of sugar. Blowing powdered sugar, or fine sugar-candy, into the eyes, has long been a popular practice to remove films, and ophthalmies. Perhaps the practice originated with DIOSCORIDES.

GALEN, in his 7th book of the temperaments and faculties of medicines, *περι Μελιτος*, says,—

Την

Τὴν δύναμιν δὲ παραπλησίον αὐτῇ, καθ' ὅσον
 απορρυπτεῖ, καὶ ξηραίνει, καὶ διαφορεῖ καθ' ὅσον
 οὐτε κακοστομαχὸν ἐστὶν ὡς τὸ παρ' ἡμῶν,
 οὐτε διψῶδες, ἀποκεχωρῆκε τῆς οὐσίας αὐτοῦ.

“It possesses similar virtues (to honey), as far as relates to absterging, drying, and digesting; however, it is not hurtful to the stomach like honey, nor causes thirst; so far it differs from honey.”

GALEN also, in his 8th book of his method of healing, recommends sugar, among the articles to be used, for the regimen of the sick in fevers.

PAULUS ÆGINETA, *lib. II. cap. 54.* recommends, from ARCHIGENES, a piece of “the Indian salt, which, in appearance, resembles common salt, but in sweetness honey;” to be kept in the mouth, to moisten it in fevers.

In the very few preceding authorities we have all that those who are termed the antients, have left us on the medicinal virtues of sugar.

We must now take a survey of the confused accounts of the Arabians, being the next authorities in succession, respecting their different species of sugar.

I shall

I shall begin with AVICENNA, and give the Latin version of this author. From the rest of this tribe of copyists I shall confine myself to a few passages, which I shall give in English only.

AVICENNA says, in his chapter on honey,—

Mel cannarum lenit ventrem, et mel tabazet non lenit. Lib. II. tract. 2. cap. 497.

“The honey of canes opens the bowels; but the *tabazet* (the white sort of honey) does not.”

In his chapter expressly on sugar he says,—

Zuccarum quid est? Arundo zuccari in natura zuccari existit, et est vehementioris lenificationis quàm ipsum. Frigidius est album et est subtilius. Et universaliter est calidum in fine primi. Et antiquum declinat ad siccitatem in primo, et est humidum in ipso; et quanto magis antiquatur, tanto plus exsiccatur. Est lenificativum, absterisivum, lavativum. Et sulimenum est magis lenitivum, et proprie Alfenid; imò mel arundinis et zuccarum non sunt inferiora melle in abstergendo, et mundificando; et quanto plus antiquatur zuccarum, tanto sit subtilius. Assumptum sicut guma ab arundine, abstergit oculum. Lenit pectus,*

* Penidium Saccharum.

et removet ipsius asperitatem. Est bonum stomacho, in quo non generatur cholera: ipsum enim lædit, propterea quia ad choleram convertitur, et est aperitivum oppilationum, et in ipso est virtus faciens sitim, minorem tamen sitim, quàm facit mel propriè antiquum, et generat antiquum sanguinem fæculentum, et abstergit phlegma stomachi, et in arundine quidem zuccari est juvamentum ad vomitum. Solvit, et propriè illud quod super arundinem invenitur, sicut sal, et sulimenum quidem, et rubrum vehementioris sunt lenificationis, et quandoque inflat, et quandoque sedat inflationem, et ipsum quidem cum oleo amygdalino confert cholicæ. Lib. II. tract. 2. cap. 755.

AVICENNA, in his chapter *de Asperitate Linguae*, copying P. ÆGINETA, says, the tongue, when rough and foul in fevers, should be cleansed with oil of almonds and white sugar; and after that he says,—

Teneat in ore suo salem qui asportatur de Indiâ, et est in colore salis, et dulcidine mellis; et sumat de eo secundum quod dixit ARCHIGENES, quantitatem fabæ unius. Lib. IV. Fen. 1. Tract. 2. cap. 22.

“The sick should hold in his mouth the salt which is brought from India, which is in colour like salt, but in sweetness like honey; and he should take of it, according to the directions

directions of ARCHIGENES, the quantity of a bean."

He says again, in his chapter *de Cibatione Febricitantium in generali*,—

Mel cannæ, quod est zuccarum, et propriè mundificatum, est melius melle apis, licet ejus abstersio sit minor abstersione mellis. Lib. IV. fen. 1. tract. 2. cap. 8.

"The honey of the cane, that is, sugar, well cleansed, is better than the honey of bees, although its abstensive quality is less than that of their honey."

In his chapter *De Aduisione Linguae*, he advises sugar to be holden in the mouth, to assuage thirst. Lib. III. fen. 6. tract. 2. cap. 19.

AVICENNA further remarks, on the virtues of sugar, compared with honey;—

Quod in Syrupo Acetoso ponatur zuccarum loco mellis; quum zuccarum in abstersione non deficiat à melle plurimum valde; et sit zuccarum minus calidum quam mel, et magis remotum valde, ut convertatur in choleram, quam mel.

Tract. de Syrupo Acetoso.

"That sugar should be used in the syrup of wood sorrel (which was used among the Arabians to make a cooling beverage in the summer time) instead of honey; as sugar is not

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much

much inferior to honey in its absterfive property, and is less heating ; and much less subject to produce bile."

AVICENNA has a chapter on *Fanid*, or *Pinidium*, fugar ; which the translators have rendered *Penidii* ; the same as before termed *Alfenid*, or *Saccharum Penidium*.

He says, —

Penidii, calidi sunt et humidi in primo, et propriè albi, et sunt humidiores aliis. Sunt grossiores succaro. Sunt boni tussi. Sunt lenitivi ventris. De *Penidiis*, lib. II. tract. 2. cap. 556.

"The *Penidii* are hot and moist in the first degree, particularly the white, which are more moist than the others. They are larger than fugar. They are good for a cough. They open the bowels." He says he knew a woman cured of a consumption, and became fat, by eating a considerable quantity of conserve of roses. Lib. III. fen. 10. tr. 3 c. 6.

RHASES says, "fugar softens the throat and bowels, and does not heat but in a very small degree. Honey is hot, and soon converted into bile ; but it destroys phlegm, and is good for old men of cold habits. In summer time, and to those of a hot temperament, honey is hurtful.

hurtful. The *Pinidii* are hot ; but are alleviating to the throat, bowels and bladder, and warm the parts about the kidneys."

SERAPION, though he has a separate chapter concerning fugar, relates only the opinion of others.

He begins with GALEN, and mentions almost verbatim what I have already given from that author : particularly that fugar is not prejudicial to the stomach, nor causes thirst, like honey.

From DIOSCORIDES he has given the same account I have ; that it is a species of honey found on the canes in India and Arabia : that it is in substance like salt, and brittle between the teeth like salt.

From ABEN MESUAI, he says, " it opens the bowels, strengthens the stomach and cleanses it, particularly from bile ; which it expels by its absterfive property. The white sort is not so mollifying as the red, and that brought from *Hegen*, like lumps of salt.

"The *baofcer* fugar strengthens the stomach, and is good for pains in the bladder and kidneys, and clears the sight when used in a collyrium ; and it dries and resolves the lax films that extend from the angles of the eyes, over

the pupils: when drunk, it does not cause thirst, and on this account it is good in the dropfy, when drunk with the milk of mandragora, or *Lafaba*.

“New fugar is hot, and moist; and the old hot, and dry. It is good for wind in the bowels, and opens them, and when taken with oil of sweet almonds, it is good in the cholic; and the old sort is good for phlegm in the stomach, unless it causes thirst, and generates thick blood. That which is brought from *Aliemen*, and is like mastich, and is called *haoscer*, is good for the stomach and liver; on account of a small degree of bitterness in it: fugar is good for pains in the bladder and kidneys, and cleanses them.”

From ISAAC BENSULAIMEN he says, “the fugar brought from the region of *Heigen*, and called *haoscer*, is less sweet than the other sorts of fugar, and more drying; for which reason it does not remove thirst like the other species of fugar: but it produces good effects in pains of the kidneys, and when drunk in milk of mandragora is good in the dropfy. The milk of the *haoscer* also, when drunk with the milk of mandragora, has the same operations, in a greater degree; but it is not so safe, in habits of hot temperaments.”

From

From ABRIANIFA he says “ the *baoscer* has broad leaves, and has fugar, which comes out at the buds of the branches, and at the bottom of the leaves ; from whence it is collected : in which fugar, there is a bitterness. The tree bears a kind of apple, about the size of an egg, which yields a corrosive liquor. It produces a down, with which pillows and bolsters are stuffed. The tree is called *chercha*. When the leaves are cut, the *baoscer* yields a milk which is collected in the month of May, and skins are put in it ; and it takes off the hair. The wood of the *baoscer* is smooth, straight, and beautiful ; and musical bards, in their love songs, compare the limbs of their mistresses to it.”

De Temperament. Simpl. cap. 50.

SERAPION has a chapter also from ABEN MESUAI, on the *pinidii*, before mentioned, by AVICENNA, and RHASES. It is verbatim from AVICENNA.

Having now selected every thing pertaining to fugar from the Arabians, I shall proceed to examine the various opinions of writers in later times, concerning its properties.

The first man who took much pains to bestow a great deal of unqualified censure on the

use of sugar, was Doctor THEOPHILUS GARENCIERES; the next was our celebrated Doctor THOMAS WILLIS.—SIMON PAULI had preceded them, with his crude notions.

The opinions of these physicians were adopted, in the infancy of sugar in England, by Mr. RAY; and the sentiments of these four authors have been disseminated in every part of Europe.

GARENCIERES says, “*Saccharum et saccharata omnia toto genere huic morbo (Tabes Anglica) infensissima, & in eo progignendo multa esse censeo quorum quum usus sit tam frequens, mirum videri non debet si tanta tabidorum seges hic pullutat,*” &c.

“*Cum de saccharo prædominante qualitate sit sermo, illam esse caliditatem contendo, quamvis satis obscuram; indicio est quod sitim gignit,*” &c.

“*Qua qualitate calida non parum pulmoni obesse potest, cum pulmo sit maximè calidus et moderate frigidis potius delectetur, calidiorum vero usu facile inflammationem excipiat,*” &c.

“*Sed quod cardo totius rei est, saccharum non solum temperamento et materia, verum etiam tota substantia pulmoni est inimicum id quod neminem non ignarum mihi negaturum esse puto; cum enim non solum dulce, sed etiam sit dulcissimum, & propterea amaro è diametro oppositum numquid sequi debet, si amarum ex omnium recepta sententia super vacuos*

humores

humores siccando absorbet aut detergit, ac propterea optimaratione putredinem arcet, et corpora diu integra conservat, quod dulce propter oppositas facultates, fecundus putredinis parens esse debet, id quod etiam longe citius accidet si in partem quæ nulla coëtrice facultate prædita sit incidat, à quâ postea non possit edomari? &c.

“ Certum est nullam, vel minimam, fieri fermentationem inter ea quæ qualitatibus inter se conveniunt, ut saccharum et caro, illud enim propter dulcedinem et balsamicam qualitatem, hæc vero ob humorem dulcem, ita ad invicem accedant, ut si caro quæpiam saccharo conditur, festinam corruptionem patietur, nisi saccharum ad amaritudinem excoctum sit, cum tamen sale condita in multum tempus perseveret, eo quod inter salem qui acris est, et carnis balsamum quod dulce est, quædam fit fermentatio propter dissidium qualitatum, post quam fermentationem novum quoddam temperamentum procedit; idem etiam apparet in saccharo, quod, cum ita cito carnes corrumpat, fructus tamen acidus longiuscule à putredine incolumes tutatur, quia ipsius dulcedo cum aciditate seu acerbitate fermentatur, et novum inde temperamentum perfectè mixtum producit. In supradictorum confirmationem non omittendum est, quod in insula Sancti Thomæ sub Æquatore molunt cannas, et quod superat, expresso succo, objiciunt porcis qui inde dicuntur in tam miram teneritudinem pinguescere, ut de bonitate

cum capris Hispanicis certent, denturque vulgo ventriculis invalidis ad facilem concocturam. Unde colligere est, quod, si saccharum ea vi et facultate pollet, ut suillam omnium fere carniū tenacissimam ad tantam teneritudinem adducat, eadem prorsus ratione corruptelam et sphacelum in pulmonibus accelerabit, cum ipsi sint molles et spongiosæ substantiæ, et stypticis astringentibus conserventur. Luce igitur clarius est saccharum non alimentum sed nocumentum, non alexiterium sed deleterium, esse ad Indias rursus ablegandum, ante quas detectas verisimile est effectum hunc planè latuisse, et cum iis mercibus ad nos esse advectum.” Angliæ Flagellum, seu Tabes Anglica. Anno 1647. p.92. & seq.

The substance of which is,—

“Sugar and all kinds of sweetmeats are very hurtful in consumption of the lungs, and tend much to create that disease; as I conceive, from the so frequent use of these things; and it is not to be wondered at, that consumptive complaints are so common in England.

“In respect to the predominant quality of sugar, I contend that it is heating, although hidden; and, as a proof of it, it excites thirst.

“This heating quality of sugar renders it not a little injurious to the lungs, which are in them—

themselves very hot; moderately cooling things are therefore most agreeable to their nature; but heating things easily inflame them.

“ But the most important consideration is, that sugar is not only injurious to the lungs in its temperament and composition, but also in its intire property; which, I believe, no sensible person will deny; when, from its excessive sweetness, it is diametrically opposite to the bitter principle, it must follow, if bitter things, according to universal suffrage, absorb and deterge superfluous humours, expel putrefaction, and preserve bodies sound for a great while, that sweet things, from their opposite qualities, must be the fruitful parent of putrescence; and which must necessarily be more active in their effects when a part is attacked not endowed with the power of concoction; and from which afterwards it is not possible to remove the disease.

“ It is certain there is no fermentation, or very little, produced between things which agree in their qualities, as sugar and flesh; on account of the sweetness and balsamic quality of sugar and the sweet essence of flesh, which assimilate with each other; for, if a piece of raw meat be put in sugar, it soon becomes putrid, unless the sugar should have been first
boiled

boiled until all its sweetness is consumed, and it has acquired a bitterness; but when the meat is put into salt, it will be kept from putrifying for a great length of time, from that property in the salt which is acrid, and the balsam of the meat which is sweet, causing a kind of fermentation from the opposition of their qualities; after which fermentation a certain new temperament arises.

“ The same also appears in sugar, which, though it so soon corrupts flesh, yet it will preserve acid fruits from putrefaction for a long time; because its sweetness ferments with the acidity or sharpness of the fruits, from which a new uniform temperament is produced.

“ In confirmation of the preceding observations, it is not to be omitted, that in the island of *Saint Thomas*, under the æquator, the inhabitants feed their hogs with canes, and the refuse of the cane juice; from which they are said to fatten, and acquire such wonderful tenderness, that their flesh equals in goodness the Spanish kids, and is commonly given to people with weak stomachs, on account of its easiness of digestion.

“ From hence we may infer, that if sugar possesses the power and property of converting
hog's

hog's flesh, the toughest almost of any animal's, to so great a degree of tenderness, for the same reason it must accelerate the decay and sphacelation of the lungs, when they are of such a soft and spongy substance as to require styptics and astringents to preserve them.

“ It is therefore clearer than the light that sugar is not a nourishment, but an evil ; not a preservative, but a destroyer ; and should be sent back to the Indies, before the discovery of which, probably, consumption of the lungs was not known, but brought to us with these fruits of our enterprize.”

WILLIS says,—

Saccharo condita, aut plurimum imbuta, in tantum vitupero, ut illius inventionem, ac usum immodicum, scorbuti in nupero hoc seculo immani augmento, plurimum contribuisse, existimem ; enim vero concretum istud sale satis acri & corrosivo, cum sulphure tamen delinito, constat, prout ex analysi ejus spagyricæ facta liquido patet. Quippe saccharum, prout supra innuimus, per se distillatum, exhibet liquorem aqua stygia vix inferiorem ; quod si ipsum, in vesica plurima aqua fontana perfusum, distillaveris, quamvis sal fixus non adeo ascendit, prodibit tamen liquor instar aquæ vitæ acerrimæ, urens, ac summe pungitivus ; cum
itaque

itaque saccharum, quibusvis fere alimentis commixtum, ita copiose a nobis assumitur, quam verisimile est, ab ejus usu quotidiano, sanguinem & humores, salsos et acres, proindeque scorbuticos, reddi? Author quidam insignis TABIS ANGLIÆ causam in immoderatum sacchari apud nostrates usum retulit: nescio an non potius etiam hinc scorbuti increbrescentis fomes derivetur. De Scorbuto, cap. 10. Anno 1674.*

“ I so much condemn all things that are preserved with sugar, or have much sugar mixed with them, that I consider the invention, and immoderate use of it, in this present age, to have very much contributed to the immense increase of the scurvy.

“ For it plainly appears, by the chemical analysis of sugar, that this concrete consists of an acrid and corrosive salt; but tempered with a portion of sulphur.

“ Sugar, distilled by itself, yields a liquor scarcely inferior to *aqua fortis*; but, if it be diluted plentifully with water, and then distilled, although no fixed salt will ascend, yet there will come a liquor like the sharpest brandy; hot, and highly pungent.

* He alludes to GARENCIERES.

“ Therefore

“ Therefore it is very probable, that mixing sugar with almost all our food, and taken to so great a degree, from its daily use, renders the blood and humours salt and acrid; and consequently scorbutic.

“ A certain eminent author * attributes the cause of the frequency of consumptions of the lungs, in England, to the immoderate use of sugar. I am not certain whether also the fomes of the increasing scurvy may not rather be derived from thence.”

RAY says,—

Antiquiores medici, qui superiore seculo vixerunt, unanimi fere consensu saccharum ad pectoris & pulmonum vitia, rancedinem, tussim, gutturis asperitatem, lateris & thoracis ulcera, commendant. Cæterum apud nos in Anglia non ita pridem in crimen adduci, & magna infamia laborare cæpit, medicis tum nostratibus, tum extraneis, scorbuti & tabis popularium morborum præter solitum grassantium nuperas furias, immoderato in cibus & potu sacchari usui imputantibus. Et, ne quis humidiori potius æris constitutioni eas pestes suspicetur; in Lusitania (aiunt) regione calida ob eandem rationem tabes epidemica facta est. Lu-*

* GARENCIERES.

† WILLIS and SIMON PAULLI.

sitani enim plus sacchari consumunt quam quævis alia gens præter Anglos.

De scorbuto iidem antiquiores, quos diximus, medici cum recentioribus consentiunt, eum à sacchari nimio usu produci, cum dentibus valde nocuum, nec eos nigros duntaxat reddere, sed & putrescere & vacillare & exidere facere saccharum scribant, quæ certa scorbuti signa & symptomata sunt. Saccharum enim salem acidum & maxime corrosivum continere ex distillatione patet. Scorbutus autem sali fixo in sanguine redundanti debetur, proinde iis quæ sale volatili abundant sanatur. Historia Plantarum, lib. XXII. cap. 3. p. 1279, 1280, anno 1688.

“ The physicians who lived in the last century, with unanimous consent, recommend sugar for complaints in the lungs, hoarseness, cough, rawness of the throat, and internal ulcerations: yet, among us in England, not long since, it began to be accused, and to labour under great discredit, by our own, as well as foreign physicians, who impute the ravages which the scurvy and consumption have lately made in England to the immoderate use of sugar in our food and drinks.

“ No person should therefore attribute these evils to the moisture of the atmosphere; for, they

they say, that in Portugal, where the air is warm, consumption of the lungs is there epidemic, from the same cause; as the Portuguese use more sugar than any people, except the English.

“ In regard to the scurvy, the same more ancient physicians, as well as those of later times, agree, that it is produced by the too great use of sugar; and that it is very hurtful to the teeth, and not only renders them black, but causes them to decay, and to loosen in their sockets, and to fall out; which are certain signs and symptoms of scurvy.

“ Sugar also contains an acid and very corrosive salt; which appears from distillation.

“ The scurvy is caused by a redundant fixed salt in the blood; and is therefore cured by such things as abound with a volatile salt.”

From these extracts it appears, that GARENCIERES and WILLIS were the founders of the sect of Antifaccharites.

I have been more extensive in my quotations from these writers than I should have been, if it were not that I wish to present the reader with that jargon of GARENCIERES, and abstruse and obsolete theory of WILLIS, which have been considered as standing authority by
many

many subsequent writers ; and quoted in academic dissertations, in the schools of medicine.

In WILLIS's time, according to his account, and his account is true, almost every person had, or fancied he had, the scurvy.

He says,—

Nunc fere omnes eo laborant, aut se laborare putant.

The scurvy at that time made great ravages in England ; besides which, the fashion of the day gave to the scurvy, all the minor straggling indispositions that were destitute of adoption.

Consumption of the lungs, and every other species of scrophula, are endemial in England. Scurvy is the same. This disease, which made so much havoc in the last century, is now scarcely known in England.

The scurvy, like any sporadic disease, may have its revolutions, and appear and disappear in the character of an epidemic. I do not speak of scurvy acquired by local and particular causes.

It is incredible that WILLIS and RAY, two well-informed men, should not know that the description of people most afflicted with the scurvy, at all times, and in every country, is that, which seldom taste any sugar.

It

It is not less extraordinary that the learned WILLIS should refer to so superficial an authority as GARENCIERES ; or the laborious RAY, to the weak effusions of SIMON PAULLI.

The rhapsody of GARENCIERES is entirely his own ; but what WILLIS advances has a better stamen, but it is not his own. It is taken from ANGELUS SALA, whom he has not mentioned, and from whom he has made a partial selection, merely to support his favourite theory of the scurvy.

SALA enumerates many evils which may arise in weak habits and bad constitutions from the *excessive*, and what he terms the *abuse* of sugar ; such as, debility of digestion ; loss of appetite ; blackness and loosening of the teeth ; offensive breath ; colic ; lax bowels ; bilious, scorbutic, and hysterical complaints.

But let it be remarked, that it is to the inordinate use of sugar, among already diseased people, to which SALA attributes these evils.

For, his own reflexion on the occasion is, that “ the excessive use of the most excellent and salutary things is always hurtful to the human frame.”

SALA, however, views the subject with impartiality, if not with judgement ; and does

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ample

ample justice to the wholesome properties of sugar.

Sacchari virtutes ac operationes, secundum rationem & modum usurpati, sunt sequentes:—Corpus nutrit, sanguinem probum generat, spiritus vitales recreat, semen auget, fœtum in utero firmat; quod nemo miretur, siquidem hoc subiectum, æmulam vini dulcissimi virtutem, ut porro docebo, in se complectitur, cujus proprietatem, in refectione longo morbo emaciatorum, senum, melancholicorum, moderatus usus comprobat; conducit affectibus faucium, pulmonum, raucedini, respirandi difficultati, ex defluxione acri abortis, exulcerationi item pulmonum, laterum, renum, vesicæ, purisque ex iisdem expurgationi; intestinorum asperitatem lenit, eorumque excrementa emollit, & expulsionem apparat; vulnera in corpus penetrantia & puncturas, ut etiam oculorum maculas, extergit; dolores ulcerum & tumorum, humores influxos coquendo, aut si ad suppurationem inhabiles sunt digerendo, dissipat; pluresque alios in medicina usus habet, brevitatis gratia prætermittendos. Saccharologiæ, part I. cap. 6. anno 1637.

“ Sugar, used in a proper manner, nourishes the body, generates good blood, cherishes the spirits, makes people prolific, strengthens children in the womb; and this is not astonishing, because

because it contains similar virtue to the very sweet wines; which property is shewn by the effects, produced by the moderate use of sugar, in restoring emaciated people, after long sickness; and strengthening the aged, and low-spirited weak people.

“It is serviceable also in complaints of the throat, and lungs; hoarseness, and difficulty of breathing, arising from an acrid defluxion; for ulcerations of the lungs, chest, kidneys, and bladder; and to cleanse those parts from purulent matter.

“It eases pains of the intestines, softens the fæces, and prepares them for expulsion; it cleanses wounds and punctures in the body; also films in the eyes.

“It removes pains in ulcers and tumours, by concocting the flux of humours; or, if they have no tendency to suppuration, by dispersing them.”

What I shall further select, together with the preceding, will shew the estimation in which sugar has been held, by learned men, at different periods, in different countries; and will embrace all that relates to it deserving notice.

BAPTISTA PORTA, who, in point of date, was much earlier than the authors before men-

tioned, must not be omitted; because his opinion of sugar was the prevailing one, prior and down to his time, all over Europe. Besides, as he lived at Naples, the use of sugar was better known to him, at that period, than to any contemporary writer in the northern parts of Europe; where it had then scarcely entered into dietic use. He says,—

Ex barundinibus saccharum extrahimus, non solum id incorruptibile, sed aliis præstat ne corrumpantur; vulneribus injectum à putrefactione liberat; ex eo solo ingentia vulnera sanari vidimus. Sit igitur familiare saccharum vitam prolongare cupientibus, quia nec humores, nec cibum in ventre putrescere, permittit. Phytognomica, lib. V. cap. 1. p. 201. anno 1560.

“ Sugar, extracted from canes, is not only incorruptible in itself, but preserves all other things from corruption; sprinkled upon wounds it keeps them from mortifying. I have seen very large wounds cured only with sugar*. Therefore sugar should be constantly

* The method of treating fresh wounds among the Turks, is, first to wash them with wine, and then sprinkle powdered sugar on them. The celebrated Monsieur BELLOSTE cured obstinate ulcers, with sugar dissolved in a strong decoction of walnut leaves. This I have found to be an excellent application.

used by those who wish to prolong life ; because it will not suffer the humours, nor the food, in the body to putrify."

POMET says, " The white and red sugar-candy are better for rheums, coughs, colds, catarrhs, asthmas, wheezings, than common sugar ; because, being harder, they take longer time to melt in the mouth, and keep the throat and stomach moister than sugar does. Put into the eyes, in fine powder, it takes away their dimness, and heals them being bloodshot ; it cleanses old sores, being strewed gently on them." *Histoire général des Drogues, Lib. II. cap. 38, anno 1694.*

LEMERY gives nearly a similar account of sugar ; but says it is hurtful to the teeth, and causes vapours. *Traité Universel des Drogues Simples, anno 1693.*

HERMANN says, " Sugar consists of a sweet soft mucilage, and an agreeable sharpness ; from whence it becomes an aliment as well as a medicine. The Indians boil it in water with a small quantity of flower for nourishment. It promotes urine, and is specific in coughs, hoarseness, sharp humours, and other diseases of the lungs.

“ It should not be used in large quantities by the melancholic, hypocondriacal, and hysterical, nor by people in fevers, on account of its proneness to ascension.

“ With fat broth and *sal gem*, it is used in glysters for children; and it is also given to them, newly born, to relax the bowels, with oil of sweet almonds.

“ Taken with oil of sweet almonds, it is a remedy for pains in the bowels. It is an excellent vulnerary and balsamic, resisting putrefaction; it is good for putrid ulcers, and absterges clouds and films in the eyes. It is hurtful to the scorbutic, and to such as are subject to bilious colics. It is hurtful also to the teeth and gums; rendering the breath offensive, and the teeth black and rotten. In glysters it is good against worms, and is also an anthelmintic remedy taken by the mouth.” *Cynosura*, vol. I. p. 704 & seq. anno 1710.

BOERHAAVE says, —

“ Sugar never generates phlegm, but, on the contrary, dissolves it. Neither does it increase the bile, or is converted into it; but opens, attenuates, and divides it. At the same time, by dissolving the oleaginous particles in the body, it may induce leanness; and, by too much
attenuation,

attenuation, produce debility, and too great laxity. For which reason, it is often found hurtful to the ricketty and scorbutic." *Element. Chemiæ, vol. II. p. 260, anno 1724.*

GEOFFROY says,

"Sugar, taken moderately with food, affords good nourishment. It promotes concoction, if after a full meal a lump of it be eaten.

"Almost all physicians recommend it in complaints of the chest and lungs. A lump of sugar or sugar-candy, held in the mouth, softens the acrimony of the phlegm, assuages coughs, and relieves rawness in the throat and fauces; as the sugar, so melting and swallowed, forms with the saliva a defence to the parts.

"It promotes expectoration, particularly if reduced to the consistence of a syrup with the oil of linseed, or sweet almonds. Taken in this manner, it also eases the colic and pains in the bowels, and assuages the gripes in children.

"Drinks, sweetened with sugar, cleanse the chest, and ease coughs by correcting the phlegm; they remove hoarseness, cleanse ulcers of the lungs, force the urine, open the bowels, and are salutary in the pleurisy and peripneumony.

“ But, if taken alone in a great quantity, it is hurtful, and particularly to bilious people. It ferments in the stomach and intestines, excites wind, and, by its fermentation, produces bile ; and, by attenuating, renders it more fluid. Hence sugar and sweet things are said to create bile.

“ From the saline spiculæ of sugar, the bile is rendered more acrid ; from which an heat is not only kindled in the bowels, but also in the whole body, and is carried into the mass of blood.

“ It creates worms in children.

“ It is hurtful to the teeth, causing blackness and scales, and making them loose. Therefore, always after using much sugar, it is proper to rinse the mouth and teeth carefully.

“ Nothing, however, is to be feared from the moderate use of sugar ; but, on the contrary, we find that an agreeableness is added to our diet, by which the stomach is disposed to perform a proper digestion of the food ; and the gastric fluid and the aliments are assisted, for the necessary fermentations, both in the stomach and the bowels ; from whence the best quality of the blood, and other humours of the body depending on the first concoction, is produced.”

De Vegetabilibus, Sect. I. Art. 9, anno 1741.

In

In taking a survey of the writers on sugar, it is impossible to overlook Dr. FREDERICK SLARE; whose unqualified praises of the virtues of sugar may be properly opposed to the unqualified censures bestowed on it by GARENCIERES and WILLIS. Neither must honest old LIGON be forgotten.

“Sugar,” says LIGON, “has a faculty to preserve all fruits that grow in the world from corruption and putrefaction; so it has a virtue, being rightly applied, to preserve us men in our healths.”

“Dr. BUTLER, one of the most learned and famous physicians that this nation or the world ever bred, was wont to say, —

*If sugar can preserve both pears and plumbs,
Why can it not preserve as well our lungs*?*

“And, that it might work the same effect on himself, he always drank in his claret wine great store of the best refined sugar; and also prescribed it several ways to his patients, for

* The Doctor might have been a famous physician; but much is not to be said here, for his rhyme or his reason. The old adage is not left far behind by the Doctor. —

*That which preserveth apples and plumbs,
Will also preserve liver and lungs.*

colds, coughs, and catarrhs; which are diseases that reign in cold climates, especially in islands, where the air is moister than in continents.” *History of Barbadoes, anno 1673.*

SLARE says, —“ I have a strong and home argument to recommend the use of sugar to infants; of which to defraud them is a very cruel thing, if not a crying sin. The argument I bring from Nature’s first kind tribute, or intended food for children, so soon as they are born; which is, that fine juice or liquor prepared in the mother’s breasts, called breast-milk, of a fine delicate sweet taste. This sweet is somewhat analogous, or a taste agreeable, to sugar; and, in want of this milk, it is well known, sugar is brought to supply it. You may soon be convinced of the satisfaction which a child has from the taste of sugar, by making two sorts of water-paps, one with, and the other without, sugar; they will greedily suck down the one, and make faces at the other. Nor will they be pleased with cow’s milk, unless that be blessed with a little sugar, to bring it to the sweetness of breast milk.

“ I will set down an experiment I had from a friend. He was a little lean man, who used to drink much wine in company of strong
 2 drinkers.

drinkers. I asked him how he was able to bear it. He told me that he received much damage in his health, and was apt to be fuddled, before he used to dissolve sugar in his wine; from that time he was never sick nor inflamed, nor fuddled with wine. He usually drank red wine.

“ I made use of sugar myself in red wine, and I found the like good effect; that it prevents heating my blood, or giving my head any disturbance, if I drink a larger portion than ordinary.

“ I allow about two ounces of sugar to a pint of wine; and dare assert that this proportion will take off the heating quality of wine in a good measure; and, after one has some time used himself to add sugar to his wine, he will be pleased with the taste, and feel the comfortable and cordial virtue of this composition.

“ Let those that are thin, and apt to have hot hands and heated brains upon drinking wine, and cannot abstain or be excused from drinking, take notice of this counsel, and try it for some time; and they will be pleased with the delicious taste, and salubrious effects, of this saccharine addition.” *Vindication of Sugars, anno 1715.*

SUGAR, analytically examined, demonstrates phlegm, spirit, acid, and oil; and, by fermentation, yields an ardent spirit.

Two pounds of refined sugar produced one ounce and thirty-six grains of a limpid, inodorous, insipid phlegm; twelve ounces and six drams of a liquor at first limpid, then brownish and empyreumatic, then acid, and then urinous; and six drams of thin brownish oil.

The black residuary mass in the retort weighed eight ounces, two drams, and three grains; which, calcined in a furnace for fifteen hours, left one ounce, one dram, and ten grains, of brown cinders; from which two drams and forty grains of a fixed alkali salt were obtained by lixivium.

In the distillation there was a loss of eight ounces and six drams; in the calcination, seven ounces and fifty-three grains.

Sugar is an essential salt, consisting of an acid salt, oil, and earth. It shews no signs of acid or alkali. It takes flame, and burns brightly. It dissolves easily in aqueous menstrua, but not in spirituous or oily. Dissolved in water, it undergoes fermentation, and acquires first a vinous, then an acetous flavour.

If one pound of sugar be dissolved in six or eight pints of water, and a spoonful of the yeast

yeast of beer be added to it, and well mixed, and exposed to gentle heat, in a vessel properly closed, but the vessel must not be full, in a few hours it will begin to ferment with great vehemence; and in three or four weeks, more or less, according to the quantity of liquor, and warmth of the situation where it is placed, it will produce a strong vinous liquor, not unlike honey and water. This liquor distilled yields a strong ardent spirit. If the whole fermenting materials be exposed longer to a continued heat, a strong vinegar, like that of wine, will be produced; by the liquor changing from its vinous to its acetous state.

Among more recent chemical investigation, and in the higher elementary branches of chemical science, discoveries have been made important to arts and manufactories; and also for the economical purposes of life. Sugar has not escaped that scrutiny, which the magnitude of such a subject demanded.

The renowned BERGMAN gives us the following new and interesting observations:

“Sugar being justly considered as an essential salt, it will readily be granted, that it contains an acid; this acid may be separated, and exhibited

exhibited in a crystalline form, by the following process:—

“(A) Let one ounce of the purest sugar, in powder, be mixed, in a tubulated retort, with three ounces of strong nitrous acid, whose specific gravity is nearly 1,567.

“(B) When the solution is completed, and the most phlogisticated part of the nitrous acid has flown off, let a receiver be luted on, and the solution gently boiled. In this process an immense quantity of nitrous air is discharged*.

“(C) When the liquor acquires a dark-brown colour, let three ounces more of nitrous acid be poured on, and the boiling continued until the coloured and smoking acid has entirely disappeared.

“(D) Let the liquor in the receiver be then poured into a larger vessel; and, upon cooling, small quadrilateral prismatic crystals are found adhering together, at an angle generally of about 45 degrees: these, collected and dried on bibulous paper, weigh 109 grains.

“(E) The remaining lixivium, boiled again in the same retorts, with two ounces of nitrous

* In order to procure this acid, common aqua fortis will serve as well as the strongest nitrous acid; and any glass, thin enough to bear a moderate heat, will do as well as a retort.

acid, until the red vapours begin to disappear, upon cooling, as before, affords 43 grains of saline aciculæ.

“(F) If to the viscid glutinous liquor which remains, there be added, at different times, small quantities of nitrous acid, amounting in all to two ounces, by boiling and evaporating to dryness, a saline mass is at length formed, brown, glutinous, and deliquescent, which, when perfectly dried, weighs half a drachm; but in depuration nearly half of this weight is lost.

“(G) The crystals obtained in the manner above described, are to be depurated by repeated solution and crystallization; an operation which is particularly necessary to the portion got, as described in (F).

The last lixivium (F), digested with nitrous acid, and evaporated to dryings by the sun's heat, exhibits prisms similar to those mentioned, (D) and (E); so that this affords a method of abridging the number of depurations.

“(H) To obtain, therefore, one part of this salt, there are required 3 of sugar, and 30 of nitrous acid. Thus it may be reckoned among the most expensive salts hitherto known.

“ It

“ It must be particularly observed, that a much smaller quantity of crystals will be obtained, if the boiling be continued ever so little beyond the proper time.

“ (I) The acid thus obtained I call *acid of sugar*; not because it is procurable from that substance only, but because sugar affords it more pure, and in greater quantity, than any other matter hitherto tried.

“ Thus 100 parts of gum arabic, treated as above, with 900 of nitrous acid, at the beginning of the boiling foam violently, and, upon cooling, yield scarce more than 21 of saccharine acid, prismatically crystallized; but at the same time the solution, even to the last, separates a saccharated lime, which, when collected, weighs 11, and contains about 5 of the acid of sugar: 8 parts of highly-rectified spirit of wine, with 24 of nitrous acid, yield 3 of saccharine acid, but, for the most part, in a squamous form, and loaded with much moisture; besides, honey, and whatever substance contains sugar, in the same way, produces the same acid; and although acid of tartar, dissolved and boiled in nitrous acid, in the same manner, yields a salt somewhat similar to this, both in taste and squamous crystallization, yet it is of a whiter colour; and, besides, is unchangeable

changeable in the fire, yielding only a coal as before.

“In another dissertation it will be shewn that the acid of sugar occurs also in animal substances.

“This salt possesses many properties; some peculiar to itself, some common to it with other acids, though differing more or less in degree: and these we are now to consider.

“(A) The crystals have an exceeding pungent taste; but a solution of these, when sufficiently diluted, excites a very agreeable sensation on the tongue. Twenty grains communicate a sensible acidity to a quart of water.

“(B) It makes red all the blue vegetable juices, except that of indigo. A single grain dissolved in four ounces of water instantly makes red the blue paper for covering sugar-loaves; which is not affected by the weaker acids: and twelve grains, dissolved in a quart of water, produce the same effect upon paper tinged with turnsole.

“(C) It attacks alkalis, earths, and sundry metals; and dissolves them with effervescence, if they be united with aërial acid. These combinations serve to distinguish this evidently from all other acids.”

SACCHARATED LIME *.

“ Eighty-two parts of saccharine acid take up 100 of pellucid calcareous spar, but not immediately ; because the surface, when saturated with the acid, prevents the access of the acid to the internal nucleus. Nitrated lime is completely precipitated by acid of sugar, in the form of a white powder, not soluble in water.

“ Of 119 parts, by weight, of this powder, 72 fall to the bottom, and 47 appear upon evaporation : hence it is shewn, that 100 parts contain, of acid 48, of pure lime 46, and of water 6 ; so that not only the presence of lime in water is discovered by acid of sugar, but even its quantity may, without difficulty, be ascertained.

“ The saccharine acid attacks lime with such force that it separates it from every other : this combination, therefore, cannot be decomposed by any acid, alkali, or earth, hitherto known, and can only be decomposed by fire.

“ Hence also we understand the necessity of lime-water in the purification of sugar ; for

* This section is of importance to manufacturers of sugar, and analysts of water.

the juice of the cane contains a superabundance of acid, which prevents the dry concretion; and even if to pure sugar dissolved in water, be added the saccharine acid, it will not form crystalline grains.

“ Now, nothing more powerfully attracts this acid than lime; and, when united with it, it is insoluble, and either falls to the bottom, or floats in the scum. Lime-water, therefore, affords the most complete means of effecting the crystallization; as it removes the impediment, and, besides, may easily be added in any proportion, without communicating any heterogeneous matter.

“ Many persons have thought that a portion of the lime remains mixed with the sugar; but, if the purification be properly conducted, the nature of the ingredients, the circumstances of the operation, and, finally, the most accurate analysis, abundantly shew, that there is not the smallest trace of lime remaining.

“ Good sugar dissolves totally in distilled water; which could not possibly be the case if there were present any lime, either crude or united with the saccharine acid; as either of these substances, whether alone or mixed with sugar, is utterly insoluble in water.

“ * The vegetable alkali does indeed absorb the acid of sugar, but forms with it a salt not very difficult of solution; and, besides, a caustic lixivium, if used in too great a quantity, will dissolve a portion of the sugar. In saccharated lime, the earthy basis predominates: for, when boiled with syrup of violets, it strikes a green colour.

“ If we consider the nature of the acid of sugar, we shall find that it does not resemble the nitrous acid in any other instance than those properties which are common to all acids; besides, it expels the nitrous acid from lime, terra ponderosa, magnesia, and metals; yielding to the other acids nothing but alkalis; while the nitrous acid produces salt, either deliquescent or easily soluble, acid of sugar yields such as are scarcely soluble in water.

“ Alkalis, when nitrated, detonate with ignited phlogiston; but, when saccharated, shew not the least signs of deflagration, which they evidently do upon the addition of the smallest particle of nitrous acid.

“ The nitrous acid corrodes tin and antimony, but scarcely dissolves them; while acid

* The idle opinions respecting lime, used in manufacturing sugar, are here completely refuted. Lime holds the first place, in an eminent degree, in the elective attractions of the acid of sugar.

of sugar readily acts upon them : phlogistified nitrous acid, united with vegetable fixed alkali, deliquesces, does not form crystals, and is readily expelled by vinegar, or even by acid of sugar, still more loaded with phlogiston : all which circumstances by no means take place with respect to the fixed vegetable alkali united with acid of sugar.

“ Many other dissimilarities will occur upon comparison ; so that these acids are of a nature not only unlike, but in many instances diametrically opposite.

“ If any will attribute all the difference to phlogiston, I will not deny that that subtle principle forms a wonderful source of difference ; but the difference which takes place here can by no means be attributed to this, when properly examined.

“ The nitrous acid is weakened, and made far more volatile, by union with the phlogiston ; the acid of sugar much more fixed, even when loaded with so great a quantity as to be crystallizable ; it almost every where expels the strongest nitrous acid, as experiments shew ; besides, the phlogistified nitrous acid produces, with the very same matters, compounds totally different from those with acid of sugar.

“ Nothing can be judged from circum-

stances which are unknown, forged, or, at best, possible: and among all the facts yet known, concerning the acid of sugar, we can find no signs of its being derived from the nitrous acid.

“ However, let us enquire more deeply; let us principally consult nature, not indifferently and slightly, supplying the deficiencies with fiction, but candidly and properly, by apt and accurate experiments; otherwise her answers, like those of the oracles of old, will be either delusive or ambiguous.

“ But, by whatever means the acid of sugar is produced, it must be considered as distinct, and different from all others, being always essentially and specifically the same. Its singular properties, some of which are of considerable use in chemistry, shew that it deserves the most particular attention.

“ From the time of STAHL, many considered the nitrous and marine acids as generated from the vitriolic; but, if all confiding in this theory (which yet is contradicted by daily observation) had neglected the examination of those acids, considering them as subordinate and derivative, we should be to this day ignorant of many singular facts, which, by degrees, were discovered; principally because many considered

dered these acids as distinct and separate substances *.”

The saccharine matter, says the illustrious DE FOURCROY,—“ which many chemists consider as a kind of essential salt, is found in a great number of vegetables ; and may be properly ranged among their immediate principles.

“ The maple, the birch, the red beet, the parsnip, the grape, wheat, &c. contain it. MARGRAFF extracted it from most vegetables. The petals of many flowers, and the nectariums placed in these organs, elaborate a principle of this kind.

“ The sugar cane, *arundo saccharifera*, contains it in larger quantities, and affords it more readily, than any other plant.

“ Sugar consists of a peculiar acid united to a small quantity of alkali, and much fat

* Abbé FONTANA has obtained an acid perfectly like that of sugar, and saccharine substances, from all gums and resins. Mr. WATT, of Birmingham, found by adding nitrous acid to galls, and conducting the process in the way recommended by professor BERGMAN, that these astringent bodies contain the acid of sugar in greater abundance than the substance from which it derives its name. Mr. SCHRIKEL obtained an acid from galls by distillation, but very different from BERGMAN’S; as may be seen in SCHEEL’S essays. To obtain acid of sugar, without vital air, or nitrous acid, would be a fact of great importance in the present state of chemical theory.

matter. It crystallizes in hexahedral truncated prisms; and in this state is called sugar-candy. By distillation it affords an acid phlegm, and a few drops of empyreumatic oil. The residue is a spongy light coal, which contains a small quantity of vegetable alkali. This salt is inflammable. On hot coals it melts, and swells up very much, emits a penetrating vapour, and becomes converted into a brown yellow matter. It is very soluble in water, to which it gives much consistence, and constitutes a kind of mucilage, called syrup. Syrup diluted with water is capable of fermentation, and affords ardent spirit.

“BERGMAN has obtained, from all saccharine matters, especially sugar, an acid of a peculiar nature.

“Though, at the time of the first discovery of this acid, it was thought that the saccharine principle was necessary for its formation*, it is at present known, that a great number of vegetables, which are not saccharine, afford it in greater abundance: such are gums, starch, vegetable gluten, salt of sorrel, lemon juice, spirit of wine, and animal matter, as M. BERTHOLLET has discovered.

* *Manna* affords an acid of the same nature.

“Among

“ Among these substances, those which produce the greatest quantity of this peculiar acid, by the action of spirit of nitre, are such as do not afford fugar.

“ Pure fugar did not afford BERGMAN more than one third of its weight of acid ; and M. BERTHOLLET obtained more than half, from wool.

“ It seems, therefore, as M. DE MORVEAU thinks, that this acid is formed by the union of a peculiar attenuated oil, which exists in all organic substances, and is the same throughout ; and that consequently the name of saccharine acid is improper.

“ SCHEELÉ has observed that the acid of lemons, chrySTALLIZED by the process described by BERGMAN, does not afford saccharine acid by treatment with nitrous acid ; though lemon juice itself affords it. The vitriolic acid, employed for the purification of this acid of fugar, seems therefore to decompose the oil which forms the base of the saccharine acid.”

The saccharine principle of grapes, berries, and fruits, is the basis of their respective wines ; therefore almost every description of wine may be imitated by art, from fugar.

The wines of France, Italy, Spain, and Portugal, particularly of the two last countries,
are

are not only adulterated, but successfully counterfeited from sugar.

They who understand perfectly that part of the manufacture which relates to colouring the liquor, and giving it the essential characteristic of the relative vegetable flavour, can deceive people of no mean judgment, and sell them a cask of wine “*neat as imported.*”

Of other vegetable juices abounding with sugar, LEWIS has given the following description, in his translation of NEWMANN’S chemistry :

“ In some parts of North America, particularly in Canada, a kind of sugar is prepared from the juice which issues upon wounding or boring certain species of the maple tree, one of which is named from hence the sugar-maple ; as also from the wild or black birch, the honey locust, and the hickory. The maple is most commonly made use of for this purpose, as being the richest, and as best enduring the long and severe Winters of that climate. The juice is boiled down, without any addition, to a thick consistence, then taken from the fire, kept stirring until its heat is abated, and set in a cold place, where the sugar quickly concretes into grains, resembling common brown powder sugar.

“ The

“The trees are tapped early in the Spring, about the time the snow begins to melt. It is observable, that when the weather begins to grow warm they bleed no more; and that after the bleeding has stopped they begin to run again upon covering the roots with snow. The more severe the Winter has been, the juice is found to be richer, and in greater quantity. The trees which grow on hills, or high land, yield a richer juice than those which are produced in low countries; and the middle-aged than the young or old.

“Mr. KALM informs us, in the Swedish Transactions for the year 1751, that one tree, if the Summer does not come on hastily, will yield about forty-two gallons of juice, English measure; and that the quantity which issues in one day is from three to six gallons; that eleven gallons of juice of middling quality give a pound of sugar, and that a pound has been gained from three gallons and an half. That two persons can, in one Spring, prepare commodiously two hundred pounds. He observes, that this sugar is weaker than that from the sugar-cane; and that it is reckoned that a pound of common sugar goes as far in sweetening as two pounds of maple sugar.

“The

“The large maple, commonly called *sycamore-tree*, bleeds also in Europe; from which an actual sugar has been prepared. In the Transactions above mentioned, for the year 1754, there is an account of some experiments made in this view upon the Swedish maple. Eight trees, none of them under thirty years, bled, in four days, fourteen gallons of juice, which inspissated gave two pounds and an half of brown sugar. Another time, the same eight trees bled, in three days, ten gallons and an half, which yielded one pound four ounces of sugar, with half a pound of syrup. It is the saccharine juice of the maple-tree, which, exuding from the leaves, renders them so apt to be preyed upon by insects.

“The common birch bleeds also a large quantity of sweetish juice, which yields, on being inspissated, a sweet saline concrete, not however perfectly of the saccharine kind; but seeming to approach more to the nature of manna.

“There are fundry other vegetables, raised in our own country, which afford saccharine concretes; as beet-roots, skirrets, parsneps, potatoes, celery, red cabbage-stalks, the young shoots of Indian-wheat. The sugar is most readily obtained from these, by making a tincture

ture of the subject in rectified spirits of wine ; which, when saturated by heat, will deposit the sugar upon standing in the cold *."

We have now some rational data concerning the real principles of sugar ; from which it may be suggested, that it has not even yet been so fully investigated, but that it may be applicable in many ways more than we are at present acquainted with, to a variety of interesting purposes.

But, before I proceed in the observations I have to offer the public on the dietetic and medicinal uses of sugar, it may be proper to submit some remarks, the result of my literary researches, to the learned and curious. This may contribute to settle many vague notions and erroneous opinions relative to the heraldry of sugar, and the cane, of which it is the produce.

I have before observed, that the ancient Grecians and Romans had no knowledge either of the sugar-cane, or of sugar.

For, there is no mention made of the SUGAR-CANE among the Grecian writers, until an hundred years after HIPPOCRATES ; nor among

* Sugar is also obtainable from grapes ; particularly from dried raisins. We frequently find large grains of pure sugar among *Malaga* raisins, that have lain long compressed together.

the Roman writers, until the time of POMPEY's expedition into Syria.

SUGAR is not mentioned by either Grecian or Roman writer until the time of NERO. Neither poet nor historian mentions it in the Augustan age.

In the districts of Asia, inhabited by the Hebrews and Israelites, at the time that country was traversed by the Grecians and Romans, sugar was there unknown.

There is no record among the Jews, even so late as at their dispersion, on this subject.

From the writers on the expedition of the Crusaders but little is to be collected respecting the sugar-cane, and less of sugar; notwithstanding sugar had been a commercial article for centuries prior to that memorable epoch of insanity*.

In the writings of MOSES, and in many parts of the Bible written by others, we find the word קנה *Kaneh*.

This word, passing into the Arabic language, became the origin of *canna*, a cane.

But this קנה in the Bible has many significations.

* *Histoire du Commerce de Venise*, p. 71. 100.

As a verb in the Hebrew, קָנָה *kanab* is, to buy, procure, possess. קָנָה as a noun, property which is purchased, or possessed. It is likewise a spear * ; a staff † ; a reed, or rush ‡ ; a balance § ; bone of the arm || ; branches of the candlestick in the temple ¶.

It is said by several writers, that by קָנָה, in some places in the Bible, the *sugar cane* is meant ; and consequently that this plant was known to the ancient Hebrews. This is to our present purpose, and the first object of inquiry.

In five places only, in the Bible, this word occurs, as a noun, implying an article, or vegetable production ; to which any use, or application, is assigned as such.

These places are in *Exodus*, c. xxx. v. 23. *Canticles*, c. iv. v. 14. *Isaiah*, c. xliii. v. 24. *Jeremiah*, c. vi. v. 20. and *Ezekiel*, c. xxvii. v. 19.

If we examine the passages here referred to, we shall find that קָנָה has been doubtfully in-

* *Psalms*, lxviii. v. 30. קֶנֶן *hastæ*. 2 *Samuel*, c. xxi. v. 16.

† *Ezekiel*, c. xxix. v. 6.

‡ *Isaiah*, c. xix. v. 6, 7. and c. xlii. v. 3. 1 *Kings*, c. xiv. v. 15.

2 *Kings*, c. xviii. v. 21. *Job*, c. xl. v. 21. *Ezekiel*, c. xl. c. xli. c. xlii. c. xlv.

§ *Isaiah*, c. xlvi. v. 6.

|| *Job*, c. xxxi. v. 22.

¶ *Exodus*, c. xxv. v. 32.

terpreted

terpreted at best ; evidently erroneously in some instances ; and in none is it possible that the *sugar cane* could be meant by it.

In the preceding chapter in *Exodus* we find, —

קנה בשם וקנמן בשם

Kaneb besem, and kinemon besem.

This is rendered in the Septuagint version,

Κινναμωμον ευωδης και καλαμος ευωδης.

The Latin versions in the Polyglott have it,

Cinnamomum odoriferum, et calamus odoriferus.

In our English Bible it is, “sweet cinnamon and *sweet calamus*.”

In some of the Latin versions the קנה בשם is rendered *calamus beneolens*, and *calamus aromaticus*.

Again, in the *Canticles*, both *kaneb* and cinnamon are mentioned, as distinct articles :

קנה וקנמן

Καλαμος και κινναμωμον.

The Latin versions have this, *calamus aromaticus et cinnamomum*; and *fistula et cinnamomum*: קנה is also rendered *canna* in one version of the Polyglott, as it is by MONTANUS. Our English

English Bible has it “calamus and cinnamon.”

In *Isaiab*, this *kaneh* appears to be highly grateful to God, who is represented by him as being angry with the Israelites, for neglecting their burnt offerings and sacrifices.

לא קניית לי בכסף קנה

In our English Bible this passage is,—

“Thou hast bought me no *sweet cane* with money.”

This is the passage which has misled so many people; from *kaneh* being erroneously rendered *sweet cane*.

Jeremiah represents God, as being angry with the Israelites; and will not receive their burnt offerings, and sacrifices. Here also the *kaneh* is mentioned by God, as an article of the first consideration.

וקנה הטוב מארץ מרחק

The whole verse is thus rendered in the English Bible.

“To what purpose cometh there to me incense from Sheba? and the *sweet calamus* from a far country? Your burnt offerings are not acceptable to me, nor your sacrifices sweet unto me.”

K

The

The Septuagint has the part of the verse I have quoted from the Hebrew, *κινναμωμον εκ γης μακροθεν*. CINNAMON *from a far country*. In the Latin versions it is rendered *calamus suaveolens de terra longinqua*; and *cinnamomum de terra longinqua*; and *calamus aromaticus de terra longinqua*.

It is necessary to observe here, that, in the Septuagint, קנה is converted into *κινναμωμον*, *cinnamon*; which word is not in the original text; and the epithet טוב, *tub*, good, perfect, best, is entirely omitted.

These are errors in the labours of those great men, who first took the Hebrew Bible out of the hands of the Jews, and gave all that is known of it to posterity.

But these errors have led some writers, who knew no more of קנה than what they obtained from this passage in the Bible, to suppose it was a synonyme for cinnamon.

In *Ezekiel*, we find the *kaneh* enumerated by God, among the boasted commodities of merchandize at Tyre, in her most flourishing state of commerce.

קנה וקנה במערבך היה:

“ *Cassia* and *calamus* were in thy market.”

In *Exodus*, *kaneh* is mentioned by MOSES as one of the four spices in the *Holy Anointing Oil*; which, he says, God ordered him to make in the following manner:

“Take thou unto thee, principal spices of pure myrrh 500 shekels; sweet cinnamon and *sweet calamus*, of each 250 shekels; cassia 500 shekels; and of olive oil an *hin*. And thou shalt make it an oil of Holy Ointment, to be made an ointment compound, after the art of the apothecary*.”

With this *Holy Anointing Oil*, MOSES says, he was directed by God to anoint the tabernacle, the ark of the testimony, the tables, the vessels, the candlesticks, the altar of incense, the altar of burnt-offering, and the laver and his foot, that they might be sacred; he was also ordered to anoint AARON and his sons, and consecrate them, that they might minister in the priests office; and it was to be an *Holy Anointing Oil* for the children of Israel throughout their generations.

MOSES, in this remarkable chapter, mentions also the other composition, so venerated by the Israelites. This is the *Holy Perfume*; which, he says, God directed him to make in the fol-

* רוקח an apothecary, or compounder of sweet ointments.

lowing manner, for perfuming the Tabernacle.
 “ Take unto thee sweet spices, stacte, and onycha, and galbanum; these sweet spices, with pure frankincense, of each shall there be a like weight.”

“ And thou shalt make it a perfume, or confection, after the art of the apothecary, tempered together, pure and holy.”

This *Perfume*, like the *Holy Oil*, was not to be used for profane purposes, nor even to be imitated. For, whosoever should attempt to make either, or put any of the oil on a stranger, or smell to a perfume compounded in a similar manner, was, MOSES says, by God's decree, to be “ even cut off from his people.”

The ancient Jews delighted in spicy odours. MOSES made fumigation, and the use of aromatic drugs, part of their religion.

They used them even in their beds: —

נפתי משכבי מר אהלים וקנמון :

“ I have perfumed my bed with myrrh, aloes, and cinnamon*.”

The ingredients they used were indeed coarse, but wholesome. By fumigation and per-

* *Proverbs*, c. vii. v. 17. English Bible.

fumes, they corrected the foul air in their tabernacles, and other places where many dirty people were crowded together ; by which means diseases were prevented.

This doctrine of fumigation, is one of the many excellent lessons in the Bible, which has been much neglected.

It seems to have arisen from perverseness among Christians, hatred to the Jews, and disrespect to Moses, who knew all sciences, and was an excellent physician, that they have profited so little by several wise practices, as well as precepts, in the Bible. The papistical Christians, it is true, burn frankincense in their churches ; but it is chiefly near the altar, where the priest only is benefited by it.

The Christians in England cleanse their houses and public places by water, heated air, and ventilation ; and hence it is we have to lament, that often the best Christians die of consumptions.

In England the Christians are much cleaner than they used to be. They would now call a man, —

“ Misbeliever, cut-throat dog, and spit upon his gaberdine *,”

* *Shylock*.

if he were to advise their taking an hint for purifying their persons, or places of devotion, after the manner of the Israelites.

But I must finish my observations on *kaneh*.

What this קנה was, I know not. It could not be the *acorus*, or *calamus aromaticus*; that was too plentiful to be so valued; and grew in Syria, Arabia, and the islands of the Gentiles, and in all the swamps and marshes in the adjacent countries to the land of Israel; and was not brought מארץ מרחק “from a far country.”

That the *kaneh* was some spicey produce of a tree, concretion, bitumen, wood, bark, or gum, is certain; and it is also certain that it was not only aromatic, but precious, from the epithets given to it, and from its uses among the chosen people, and the estimation in which it was said to be holden by God.

The epithet נשם imports *spicey, sweet scented*, not *sweet tasted*; therefore the *sugar cane* is entirely out of the question.

The *sugar cane* does not yield a fragrant smell, naturally or burnt. Neither will it keep found, when ripe, after it is cut; but will perish like the stalk of a cabbage-plant; and

could

could not be preserved from rotting in a passage “from a far country*.”

How קנה should have been rendered *calamus*, so universally as it has been, I cannot conceive.

The authors of the Septuagint translation of the Bible must have understood, from the time and countries in which they lived*, the Hebrew language better than any people at this day. But here they have misguided their implicit followers; and, indeed, this is not the only instance where they were not so correct as they should have been.

We find among the Greek writers καννα, δοναξ, and καλαμος; and among the Roman writers *canna*, *arundo*, and *calamus*;—but these names are used indiscriminately for a *cane*, or a *reed*.

This has been the cause frequently of misunderstanding these writers; where the context has been inadequate to settle a precise and determinate meaning.

The γλυκοκαλαμος, in later times, of NICHOLAS MYREPSUS, which his translators have rendered

* Neither did cinnamon come “from a far country.” That was the produce of Arabia. “Habet India, quæ Australis est, cinnamomum sicut Arabia.” STRABO, lib. XV.

† About 227 years before the Christian æra.

dulcis calamus repurgatus, is the pulp of the *cassia fistula**.

It has been said, by some writers, that the word שֶׁכַּר in the Bible has an allusion to fugar.

This word, like *kaneh*, according to the construction of the Hebrew language, has several significations; but none whatever that has any relation to fugar.

As a verb, שָׁכַר *shakar*, or *shacar*, imports to drink to excess, to be drunk; to hire for wages.

As a noun, it forms various derivatives; but is chiefly used for some exhilarating, strong, and intoxicating liquor. Our English Bible every where denominates it, "strong drink."

The Septuagint renders it σικερα†, σικερα‡; the Latin versions *sechar*, *sicera*.

MOSES says, GOD ordered him to proclaim to the children of Israel, that "when either man or woman shall separate themselves to a vow, *a vow of a Nazarite*, he shall separate himself from wine, and שֶׁכַּר (*shecar*) *strong drink*; and shall drink no vinegar of wine, or vinegar of שֶׁכַּר (*shecar*) *strong drink*; neither

* *De Antidot. Sect. 1. c. 449. anno 1280.*

† *Numbers, c. vi. v. 3. Isaiab, c. xxix. v. 9.*

‡ *Numbers, c. xxviii. v. 7.*

shall he drink any liquor of grapes, nor eat moist grapes, or dried *.”

The inspired prophet JEREMIAH says, God gave him “ the cup of his fury ;” and that he “ made all nations drink of it, to whom the LORD had sent him ;” and he said unto them, “ drink ye, and be *וְשִׁכְרוּ* (*veshikru*) drunken, and spue, and fall †.”

These passages are here given, the original Hebrew words excepted, from the English Bible † ; which, though not an elegant, is a faithful translation of the Hebrew.

What sottish liquor *שֵׁכָר* *shekar* was, no person knows. It was probably made from grain.

The most wild and barbarous nations have ever had the art of making intoxicating liquors to get drunk with, by some process of fermentation.

The sugar cane, though indigenous to latitudes within, and near the torrid zone, arrives at excellence only in the hottest climates. But much rain, or water, as well as sun, is necessary to its maturity.

When we consider that the saccharine principle is the soul of vegetable creation, and

* Numbers, c. vi. v. 3.

† Jeremiah, c. xxv. v. 27.

see how sparingly it is diffused through the general productions of the earth ; and how little is collected from the wide range of flowers, by the consummate skill of the laborious bee ; or from roots, trees, fruit, and grain, by the chemic art ; we cannot but admire the partiality of Nature to the luscious CANE, her favourite offspring, the sublimest effort of heat and light.

The proportion of sugar to the cane juice depends on the quality of the cane*. We consider a pound of sugar from a gallon of cane juice, as good yielding ; and that an acre of land, giving three hogshheads of sugar, of 14 cwt. each, as ample produce. But for this quantity the soil must be good, and the canes of the first year's cutting, and in perfection.

In the process of refining muscovado sugar, a ton weight, of good quality, gives the following products :—

	Cwt.	q.	lb.
Double, and single refined sugar,	9	1	5 ⁵ / ₁₆
Piece ditto, ...	4	0	0
Scale, or bastard ditto, ...	2	0	0
Melasses, or treacle, ...	4	1	22
Scum, and dirt, ...	0	1	0 ¹ / ₁₆
	20	0	0

* See p. 81.

That sugar is nutritious in the most eminent degree has been long known. It is the basis of all vegetable nutrition.

Every root and earthly production is nutritious, in proportion to the saccharine principle it contains. Nothing nourishes that is entirely free from this saccharine principle; otherwise, turnips would be as little nutritive as cucumbers, being, like them, the sugar excepted, scarcely any thing but water.

Milk is nutritious on the same account; and that milk is most nutritious which most abounds with saccharine sweetness; and when milk is defective in this quality, from bad pasturage and other causes, our vegetable sugar should be added to it, to remedy such defect.

In all cases sugar helps the assimilation of milk in the stomach; and not only prevents its curdling, and disordering that organ, but corrects the tendency which milk has to injure the breath, by adhering to the teeth and gums, and rendering them foul and offensive.

As milk has this property, and is much used in schools, and constitutes great part of the sustenance of most young people, a tooth-brush and water should always be employed; or at least the mouth should be well rinsed with water, after a meal made of milk.

No

No modern physicians have noticed this; but the ancients were well acquainted with the injurious effects of milk, on the teeth and gums*.

In regard to sugar being prejudicial to the teeth, this has long been known as a prudent old woman's bug-bear, to frighten children; that they might not follow their natural inclination, by seizing opportunities, when they are not watched, of devouring all the sugar they can find.

This story has had a good effect among the common people in Scotland. They are impressed with a notion that *sweeties* hurt the teeth; therefore they live contented without an article, not always within the compass of their finances.

SLARE, and many others, used sugar as a principal ingredient in tooth powders. It is a component part of many pastes, and other

* P. ÆGINETÆ, lib. I. c. 86. Lac gingivas & dentes lædit. Quare post ipsum acceptum, primum aqua mulsa, deinde vino adstringente, os colluere oportet.

ORIBASII à GALENO Medicin. Collect. lib. II. c. 59.—Mirum in modum usus lactis frequens dentes & gingivas lædit, nam gingivas flaccidas, dentes putrefactioni & erosioni obnoxios facit: ergo sumpto lacte, os vino diluto colluendum est; erit etiam accommodatius si mel eidem adjicias.

dentri-

dentrifices ; and what the French call *opiates*, for the preservation of the teeth and gums.

When milk is not the sole diet of children at their mother's breast, sugar, in various mixtures and vehicles, makes the chief portion, essentially, of their support.

Sugar affords great nourishment, without oppressing their tender powers of digestion. The nutritive principle of their natural food is thus happily imitated.

Sugar does not create worms in children, as has been often said : on the contrary, it destroys worms. Some writers have mentioned this * ; but my authority is my own observation.

In the West Indies, the negro children, from crude vegetable diet, are much afflicted with worms. In crop-time, when the canes are ripe, these children are always sucking them. Give a negro infant a piece of sugar cane. to suck, and the impoverished milk of his mother is tasteless to him. This salubrious luxury soon changes his appearance. Worms are discharged ; his enlarged belly and joints diminish ; his emaciated limbs increase ; and, if canes were always ripe, he would never be diseased.

* *Act. Med. Leip. anno 1700.*

I have often seen old, scabby, wasted negroes, crawl from the *hot-houses*, apparently half dead, in crop-time; and by sucking canes all day long, they have soon become strong, fat, and sleeky.

The restorative power of sugar, in wasted and decayed habits, is recorded by several physicians, in different parts of the world. I have known many people, far advanced in pulmonary consumption, recovered by the juice of the sugar cane.

FONTANUS, VALERIOLA, and FORRESTUS, assert that they had patients cured of consumptions of the lungs by a continued use of the *conserve of roses*; and REVERIUS knew an apothecary who cured himself of a confirmed consumption by almost living on the conserve of roses. Foreign journals are full of histories of consumptions cured by this medicine.

There are instances where people have scarcely taken any other nutriment than conserve of roses. Some have eaten a pound, and a pound and a half, of this conserve every day:—*three fourths of this conserve are sugar.*

The virtues of sugar are not confined to its nutritive and balsamic qualities. It resists putrefaction, and preserves all substances,—flesh, fruits, and vegetables,—from corruption.

It

It has a great solvent power ; and helps the solution of fat, oily, and incongruous foods and mixtures. It promotes their maceration and digestion in the stomach ; and qualifies the effects of digestion, to the powers of the lacteals *.

For this reason, sugar is much used in foreign cookery, and so much introduced at the tables of the luxurious in France, and also in Italy, Portugal, Spain,—and indeed in every country, excepting England, in confections, preserves, sweetmeats, and liqueurs †.

Sugar, in the form of syrup, is an admirable vehicle, to comminute and convey to the

* “*Nous pensons qu'il donne aux alimens une saveur qui dispose l'estomac à une coction plus parfaite, qui augmentant la force du levain stomacal, excite une fermentation plus complete des alimens dans l'estomac & dans les intestines, & qu'il contribue par conséquent à entretenir dans le chyle, dans le sang, & toutes les humeurs, les qualités nécessaires pour accomplir & maintenir les fonctions. Ce qui dépend toujours de la premiere digestion, dont le dérangement est le principe de tous ceux qui arrivent dans le corps humain.*” POUPPE DESPORTES, vol. III. p. 375.

“*Acria lenit, acida obtundit, salsa mitiora austera suaviora reddit, fatuis & inspidis gratum saporem tribuit; atque ut uno verbi concludam, omnium saporum domitor videri potest; nihilque absque saccharo ferè ventri gratum, panificio operi additur, vinis miscetur, aqua enim saccharo suavior, salubriorque redditur.*” NONNI, de Re Cibaria, lib. I. c. 47. p. 152.

† “*Si perquam, parce ultima menas devoretur, concoctionem juvat, satietatem tollit.*” ALEX. PETRONIUS, De Victu Romanorum, p. 328.

internal

internal absorbing vessels, any alterative, mineral, or vegetable medicine.

By its miscible property, it diffuses minutely any preparation it may hold in solution, or union, on the surface of the stomach and intestines; and subjects it to the capacity of the orifices of the smallest vessels.

Sugar alone has many medicinal virtues; and made into a common syrup with water, and disguised, and perhaps somewhat improved by vegetable additions, has performed many cures in diseases, from impoverished blood, rickets, and scrophula, that have baffled the most skilful physicians; and empiricks have accordingly availed themselves of what they term ptisans, and medicated syrups.

The balsamic and fattening properties of sugar are prominently visible in all parts of the world where it is made; and not confined to the human race.

The celebrated historian Mr. BRYAN EDWARDS was too accurate in his researches, to suffer a fact, so interesting as this, to escape his observation.

In his History of the West Indies, he has drawn a faithful representation of a plantation, in the season of making sugar*.

* January, February, March, and April.

He says, — “ so palatable, salutary, and nourishing is the juice of the cane, that every individual of the animal creation, drinking freely of it, derives health and vigour from its use. The meagre and sickly among the negroes exhibit a surprising alteration in a few weeks, after the mill is set in action. The labouring horses, oxen, and mules, though almost constantly at work during this season, yet being indulged with plenty of the green tops of this noble plant, and some of the scummings from the boiling house, improve more than at any other period of the year *.”

It must be observed, that muscovado, or what is called moist sugar, is laxative; and that, in using the juice of the cane, either as a luxury or a medicine, this also is of a laxative nature, particularly with people unaccustomed to it; and sometimes it operates as an active purgative, and disorders the bowels. This happens frequently to Europeans, who arrive in the sugar countries just at crop-time, and, allured by its grateful novelty, take it to excess.

It has been already remarked, that when vegetable sugar was first known, it was used

* Vol. II. p. 221, 2d edit.

only in medicine; that it was then preferred to honey, and in process of time almost entirely supplanted honey; the sweet, which had been in use among mankind, coeval with natural history.

The superiority of sugar would soon be discovered by observing physicians, as being exempt from the uncertain, and sometimes dangerous effects of honey.

There are many people whom a tea-spoonful of honey will disorder. In some habits, even that quantity will cause violent pains in the stomach and bowels; and will act as an emetic, or cathartic, or as both. In others, honey will cause erysipelas, nettle rash, itching, and a general swelling in the body and limbs, and occasion such deleterious effects, as are produced by some vegetable *fungi*; some kinds of fishes, muscles, and poisonous plants.

Medical men who have travelled, or read, or have had much experience, know what extraordinary effects result from these causes.

A melancholy instance among many I have seen, of the mischievous effects of muscles, lately occurred, in the neighbourhood of Chelsea Hospital; where a boy of seven years old was destroyed by eating them; and his father
escaped

Escaped the same fate, with great difficulty, after vomiting of blood, and convulsions.

The cause of what is considered as the poison of muscles, is generally supposed to arise from some malignant quality inherent in the fish itself; according to the place where it is found, and particular seasons. Some suppose the poison consists in a kind of *stella marina*, a sea insect, frequently found in muscles; whose spawn is very corrosive, and when applied to the skin excoriates it.

But the real cause is, in the indigestible property of a part of the muscle, which should never be eaten; and without which, muscles are innocent and nutritive.

This noxious part of muscles is the hard threads, or wiry filaments, by which they fasten themselves to one another; to the bottom of ships; and to rocks, and stones; and, as if anchored by the strongest cable, no waves nor current can break their hold.

These filaments issue from an hard cartilaginous substance, at the root of what is commonly called the tongue of the muscle, in the middle of its body.

That honey should sometimes produce the ill effects I have mentioned cannot create surprize; if we reflect that the bee distils from

every flower, in the great unweeded garden of Nature ; and that the quality of his manufacture depends on the quality of his materials.

Hence it is that honey in different countries differs so much in flavour, and consequently in wholesomeness.

The honey of some countries is poisonous to every one who makes use of it. POMPEY lost three regiments in *Pontus*, poisoned by honey* ; and PLINY says, there is a district in that country, which yields honey that makes people mad who eat it.

But the peculiar antipathy to honey, the occasion of these remarks, may be excited by the essential property of some particular vegetable in that multifarious compound ; or, most probably, by the nature of the compound itself.

Incredible as the fact may appear, I know a person who cannot touch honey with her finger, without immediate nervous affections, and cold sweats ; and, what is still more extraordinary, the handling, and smelling bee's wax, is accompanied with sensations of the same tendency. Her son, a strong, healthy young

* *Qui mel, in Heraclea Ponti nascens, ederunt, aut biberunt, iis eadem accidunt quæ ab aconito sumpto ingruunt.* P. ÆGINETÆ, lib. V. c. 51

man, labours under nearly a similar disposition.

I have long thought that many children are lost, from inattention; or, more properly speaking, from not knowing the peculiarities, by which temperaments wonderfully differ.

The physical antipathies of children are never looked for; and never discovered.

How many infants linger in a painful manner, and perish by convulsions, where no cause is known, or suspected!

Sudden illness not to be defined,—and sudden death, without any previous indisposition, or traceable vestiges on dissection after death,—are subjects on which little has been said, and nothing done.

Aversion from things obnoxious to physical organization, and repugnance to receive whatever disturbs the functions connected by sympathy, are observable in all animals.

But this spontaneous resistance of nature, is always overpowered in children; and is confounded with that indiscriminate desire or disgust, which perhaps would often fatally misguide them.

In advanced age, antipathies demonstrate themselves; and frequently in the most irresistible, and distressing manner.

Rhubarb, among several articles which might be mentioned, violently disorders some people, of all characters of habit, and periods of life. And yet this drug is forced down the throat of every infant, the moment it comes into the world.

Oil acts as a poison to some people ; but, as it does not poison every body, it is administered to infants, without suspicion.

Even manna sometimes acts as a poison.

My motives here are not to enumerate the dangerous consequences, and solitary instances of singular antipathy : otherwise, charges might be brought against every article, constituting our daily food.

BACON says, “ all life hath a sympathy with *salt* *.” This is true, and the same may be said of sugar. I have one instance of antipathy on record however, against *salt* † ; I know of none against sugar. But doubtless there are instances, where individuals dislike sugar : but I never knew an instance of sugar disagreeing with any person.

This subject leads to an extensive field, which has scarcely been entered, except by

* Hist. Nat. cent. 10. art. 982.

† BARTHOLOM. à MARANTA. *Method. Cogn. Simpl. Med. lib. 3. cap. 13.*

those who have had no desire to apply the culture of it to good and rational purposes.

I should proceed further ; but I have said enough : as my object here, is chiefly to recommend attention to such as have the care of the diet, and regimen of children ; that they may keep a jealous eye on the operations of any article of food, or medicine, which has been known to produce injurious effects in habits, under the influence of Idiocracy.

Aged people, who have no teeth, and whose digestive faculties are impaired, and as incapable as those of infants, may like infants live on sugar.

I could produce many instances where aged people have been supported many years, by scarcely any thing but sugar.

Taken in tea, milk, and beer, it has been found not only sufficient to sustain nature, but has caused lean people to grow fat, and has increased the vigour of their bodies. The late king of Sardinia ate a great quantity of sugar daily. He ate it by itself ; without dissolving it, or mixing it with any thing. It was his chief food. After his death, his body was opened, and all his viscera were perfectly found.

The great duke of Beaufort, as he was called, who died about an hundred years ago at the age of seventy, was opened ; his viscera were found in the same manner ; as perfect as in a person of twenty : with his teeth white, and firm. He had for forty years before his death used a pound of sugar daily, in his wine, chocolate, and sweet-meats.

SLARE says, his grandfather Mr. *Malory* was strong and chearful in his eighty-second year ; at which time his hair changed somewhat dark ; his old teeth came out, pushed away by young ones ; which continued so to do until he had a new set of teeth complete. He lived easy, and free from pain, or sickness, until his hundredth year, when he died. He used sugar to a great degree in all his food, vegetable, and animal : and delighted in all manner of sweet-meats.

SLARE says, he followed the practice of his grandfather ; and used sugar in every thing he ate and drank : and in the sixty seventh year of his age, all his teeth were sound, and firm, and in their full number.

I know a person at this time, about eighty years old, who has lived for several years almost on sugar : and is as healthy and strong,
and

and as youthful in appearance, as most people at fifty.

The cause of this fondness for sugar was an accident that happened nearly twenty years ago, which prevented the person for a considerable time, swallowing any thing but fluids, in which a portion of sugar was dissolved.

The diet now consists of sugar, and the simple vehicles in which it is taken; these are tea, milk, gruel, barley water, roasted, and boiled apples; and beer, generally for supper.

Animal food is not necessary for the pleasurable existence, and bodily health of man*; for mental pleasure and health, perhaps, quite the contrary.

In the time of PYTHAGORAS†, sugar was unknown; even to this great traveller. Otherwise his philosophy would have had more converts. His diet was impracticable in most countries, from bulk, carriage, and season. There is more nourishment in a pound of sugar, than in a load of pulse, or vegetables.

* *Prodiga divitias alimenta que mitia tellus*

Suggerit; atque epulas sine cæde et sanguine præbet.

OVID. *Met. L. XV. v. 81, 82.*

† 500 years before the Christian æra.

If the pure, the divine PYTHAGORAS, undergoing the changes he suggested *, be now in this our planet, and conscious of his former being, how must his holy spirit be depressed at the disappointment of the flattering hope he once had formed ; that mankind would rise on his foundation, to the heights of truth ; by living according to the simplicity of nature, and the dictates of reason ; that their brutal hunt after the lives of God's creatures, and making a science of butchery, would stop ; and that the earth would cease to represent a grazing ground, for slaughter ; and its bloody inhabitants a mass of canibals !

Two centuries have not elapsed, since it can be properly said, that sugar has become an ingredient in the popular diet of Europe.

There is now scarcely any person who does not mix, more or less of it, in his daily food ; excepting the poor, remote inhabitants of the interior, and northern parts of Europe ; whose cold, watery diet, most requires it.

The increased consumption of sugar, and the increasing demand for it, exceeds all comparison with any other article, used as an

* *Spiritus, eque feris humana in corpora transit,
Inque feras nosse ; nec tempore deperit ullo.*

OVID *Met. L. XV. v. 167, 168.*

auxiliary, in food : for, such is the influence of sugar, that once touching the nerves of taste, no person was ever known to have the power of relinquishing the desire for it.

When sugar was first introduced into England, it is difficult to ascertain ; and though it was in use in 1466, yet, until it was brought from the Brasils, about 1580, to Portugal, and imported from thence, it was chiefly confined to feasts, and to medicine.

The quantity consumed in England has always kept increasing ; though the whole consumption for nearly a century, subsequent to this period, was inconsiderable.

CHAUCER, in his *Troilus and Cressida*, written in 1380, mentions, allegorically, the sweetness of sugar*.

The importation of sugar into England in 1700 amounted to 481,425 hundred weight ; or 48,142 hogheads, at ten hundred weight each. The price then was thirty-two shillings the hundred weight.

The importation into England and Scotland on an average, for 1787, 1788, 1789, and 1790, amounted annually to 1,952,262 hundred weight.

* " So let your dunger *sucrid* ben alite."

The annual exportation during this period was, on an average, 296, 996 hundred weight; which leaves the annual consumption in England and Scotland 1,655,266 hundred weight; or 118,233 hogsheds, of fourteen hundred weight each *.

Thus we find 185,389,792 pounds of sugar are annually consumed in England and Scotland.

But the proportion consumed in Scotland is small; not exceeding 12,000 hogsheds, or 18,816,448 pounds. The consumption then in England only, is 166,573,344 pounds.

Now taking the population of England at 8,000,000, the proportion of sugar to each individual, if each individual had his share, would be about twenty pounds per annum.

These calculations are made, reducing the whole to *raw*, or *muscavado* sugar.

The consumption in Ireland is not in this calculation. Ireland consumes 20,000 hogsheds per annum.

Sugar is not an article of smuggling; and there were no prize-sugars at the above period.

* From 1772 to 1775 the average consumption was 114,613¹/₂ hogsheds *per annum*.

Before the Furies lighted their torches in *St. Domingue*, that beautiful island yielded, for the benefit of mankind, 200,000 hogsheds of sugar.

The importation then, into all Europe, from every part of the world, was about 500,000 hogsheds.

The East Indies have not given us a quantity exceeding 5,000 hogsheds *per annum*. The East Indies cannot, I believe, spare much more for the English market, without further expensive arrangements.

If Jamaica, and the other English sugar islands, were to share the fate of *St. Domingue*, by the horrors of war, a distress would arise, not only in England, but in Europe, not confined to the present generation, but that would descend to the child unborn. Of such importance has the agriculture of half a million of Africans*, become to Europeans.

* The negroes employed in the West Indies, in cultivating the cane, and manufacturing sugar, do not much exceed this number. Altogether there are, in the English colonies about 461,684 blacks; and in the French colonies about 489,265. In Jamaica, in the year 1698, there were 40,000 blacks, and 7,365 whites. In 1741, 100,000 blacks, and 10,000 whites. In 1787, 255,780 blacks, and 23,000 whites. The population in that island, at this time, is about the same.

The loss of sugar cannot be estimated, by a survey of the diet of Europe, before sugar was known. If it were possible that people could retrograde into the habits of that time, they would want some of the means then in use for their support.

From the loss of sugar, many articles and vegetable mixtures, which now constitute the most agreeable and most wholesome parts of the food, particularly of youth and delicate people, would be useless; and for which we have no salutary substitute.

There are some saccharite enthusiasts who attribute to the use of sugar the extinction of the plague in Europe;—that is not the case:—but it has certainly contributed to suppress the native malady of England—the *Scurvy*.

That state of the habit which we denominate scurvy, perhaps the parent of scrophula and consumption, disposes the system to the ravages of fevers; and hence the great mortality in former times; when pestilential fevers and *plagues* invaded the English, deeply infected by the scurvy.

An article in constant use, to the extent sugar now is, must have considerable influence in disposing the body to receive or resist disease. Because the blood, and the growth, or changes, and support of the frame, depend on
the

the aliment received into the stomach; and the general state of the system, exclusive of climate and particular organization, must be affected accordingly.

The formation of the body, and more of the inclination of the mind than is generally imagined, depend on the nature and quality of our food. This I had occasion formerly to remark *.

Without resorting to the metamorphosis of *Nebuchadnezzar*, MONTESQUIEU was so persuaded of this doctrine, that he asserts, in many animals, excepting their mere bones, their mental as well as their corporal character, is decided by it.

This is indeed so strongly distinguishable among the lower classes, in some countries, that one would almost conclude, a man is but a walking vegetable—or an hieroglyphic—importing the food, of which he is compounded.

Europe is in a much better state of bodily health than it was formerly. It has also undergone great changes in its mental condition; as all Europe feels. There is still some room for improvement in both. But the latter is a devious road from my object, which I must leave to divines and politicians; and confine

* Treatise on COFFEE, page 1.

myself

myself to a path, with which I hope I am better acquainted—WARWICK LANE.

There are no distempers now in Europe ravaging and depopulating whole countries ;—and, I conceive, what our ancestors reprobated, and dreaded the importation of so much, under the appellation of luxuries, has had a considerable share in this alteration.

Since European countries have had intercourse with the East and West Indies, and a free and enlarged traffic with each other, and commerce has supplied the deficiencies of one country, from the superfluities of another, Europe has greatly improved in its regimen.

The popular diet before was crude, coarse, and unwholesome. A royal English dinner of the twelfth century would be despised by a modern tradesman. Spices, wine, sugar, and culinary chemistry, made no part of the repast.

But people have not used these bounties of nature, and art, with prudence. If they have now no dread of some of the heavy calamities which then made their malignant visitations to the human race, there are too many who have by their excesses acquired others, which embitter the chronical hours of declining life.

This

This reflexion does not extend to labouring people ; they are strangers to more of foreign productions than what barely qualify their food for health ; and though short-lived, they are providentially secured against the miseries of ill-used opulence,—the derangements of gluttony and repletion : the principal diseases in England.

Diseases in general would be uniform, and never undergo much alteration, were people to feed only on the produce of their own soil. This appears in the diseases of cattle ; and also in those of Indians ; and people living in a state of nature, without foreign communication : and this likewise appears, in a great degree, among artificers and manufacturers, and such as cannot deviate in habit.

In commercial countries, where articles of foreign growth, and dissimilar climates enter into dietetic use, with the generality of a people, it is impossible that the type of their diseases should remain stationary ; or that some will not appear, and others disappear, from any considerable change, or subversion of custom.

Within my memory the inflammatory tendency of diseases in Europe, has gradually diminished. There are not so many pleuresies

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among

among the reapers in harvest, as there were formerly.

Every physician knows, that the practice employed in fevers in the last century, is now obsolete ; and that the practice of the preceding century is still more so. I speak also of diseases in general. Accurate physicians know, that fevers are continually disappointing them.

The science of medicine therefore has not improved,—it has changed: because diseases change. It is to be remembered, that HIPPOCRATES, CELSUS, and GALEN, knew all that was possible to be known in their time ; yet we cannot go by their writings ; and, if they had left us nothing but their prescriptions, we should not now be much benefited in our practice, by their labours.

The *Cow-Pox* has lately appeared in England. This is a new star in the Æsculapian system. It was first observed from the Provinces. It is so luminous there, that the greasy-heeled hind feet of Pegasus are visible to the naked eye : the hidden parts of that constellation, which have puzzled astronomers, as to the sex of Pegasus ; and which HIPPARCHUS, TYCHO, HEVELIUS, FLAMSTEAD, and HERSCHEL, could never discover. The reason now is evident.

The

The medical Pythoniffas are divided in their opinion respecting this phenomenon.

Great events are foreboded.—Some pretend that a restive *greasy-beeled horse* will kick down all the old gally-pots of GALEN —Others, that the people of England are becoming like the inhabitants of a wilderness, beyond the land of Cathay, seen in 1333, by the rare and inimitable Sir John MANDEVILE,—who, he says, were “ wild, with horns on their heads, very hideous and speak not; but rout as swine*.”

Wonderful things do certainly appear in all ages; the great ERASMUS mentions a man, one *Philario*, an Italian, who in Holland was very much afflicted with worms. While the worms were in his body, he spoke the Dutch language fluently. When his physician cured him of the disorder, he could not speak a word of that language. The Dutch worms and the Dutch language, left *Philario* together †!

In this *Cowmania* it is not enough for reason to concede, that the Cow-pox may lessen, *for a time*, the disposition in the habit to receive the infection of the *Small pox*.

All cutaneous determinations; catarrhal fevers; and every disease of the lymphatics; and

* Quarto ed. 1677. chap. 87.

† *Crede quod habes, et habes*—ERASME!

medicine, tending, to what SYDENHAM would call depurating that system, do the same.

Surgeons know, that the first inflammation of any membrane is the most violent : and that reiterated inflammation deadens sensibility.

But no complaint to which people are repeatedly subject, as the Cow-pox, can perform all circumstances in the habit, equivalent to the Small-pox, which people never have but once.

Besides, the Small-pox does not destroy the disposition in the habit to receive the Cow-pox.

If that be the case, the Small-pox and the Cow-pox, then, are not analogous ; but radically dissimilar.

The Small-pox is undoubtedly an evil ; but we understand the extent of that ill ; which we had better bear,

“ Than fly to others that we know not of.”

Inoculation has disarmed the Small-pox of its terrors ; and reduced it to management.

I have inoculated in the West Indies, and in Europe, several thousands. I never lost a patient. I speak subject to the animadversions of contemporaries. And I should not have mentioned this, but that it gives me an
op-

opportunity of saying many others, whom I know, have done the same, with the same success. Accidents, in the inoculated Small-pox, are uncommon ; and we all know from experience, that disease, properly treated, leaves nothing after it injurious to the constitution.

Can any person say what may be the consequences of introducing a *bestial* humour—the Cow-pox, I hope, does not deserve the name of disease—into the human frame, after a long lapse of years ? I mention this serious trifling, not from disrespect to the ingenious, nor to discourage inquiry ; the object well deserves it ;—but the doctrine of engrafting distempers is not yet understood by the wisest men : and I wish to guard parents against suffering their children becoming victims to experiment.—What misery may be brought on a family after many years of imaginary security !

There are several distempers of *bestial* origin, I have no doubt.

The *Raws* is one of them ; and, not being understood in Europe, and a well-known affliction in the sugar colonies, it is not foreign to my subject to notice it here.

The *yaws* naturally is an original African distemper. It may be communicated to white people, as it is to blacks, by inoculation, and by accidental contact, when the ulcerous matter is carried into the habit by absorption. I have seen several shocking instances of this sort. But it breaks out in negroes without any communication, society, or contact.

The seeds of the *yaws* descend from those who have ever had it, to their latest posterity. No period from infancy to age exempts them from it. Its appearance is uncertain.

CHEVALIER and HILLARY speak of the *yaws*; but their accounts are erroneous. CHEVALIER perhaps never saw it*. HILLARY often saw it; but he misunderstands HALI ABBAS, whom he has quoted; endeavouring to prove it is common in Arabia as well as in Africa†.

TURNER never saw it, and is absurd‡; and our great SYDENHAM, who was a total stranger to it, never committed an error, scarcely, but in this instance §.

* *Maladies de St. Domingue*, 1752.

† *Diseases of Barbadoes*, 1759.

‡ *Syphilis*, p. 5.

§ *Opera Universa*, p. 327, ed. Lugd. Batav. 1741. N. B. written anno 1679.

The *yaws* differs altogether from every other disorder, in its origin, progress, and termination.

Left to itself, it sometimes departs in 9, 12, 15, or 18 months, without leaving behind it any inconveniency. Sometimes it remains much longer, and ends in shocking nodes, and distortions of the bones. Many are destroyed by it. No person is subject to it twice.

From want of care and proper management, the torments of the *yaws* surpass all description, from the *bone ache*, and dreadful agonizing curvatures, and caries of the legs, arms, collar-bones, wrists, and almost every other bone, and articulation in the body.

There is also, sometimes, a relic after the original malady is gone, called the *master yaw*; this is an inveterate ulcer, proceeding from the largest *yaw*, or chief determination of the eruption.

Generally, this distemper terminates in what are called *crab yaws*. These are painful sores, or cracks in the feet, sometimes spongy, sometimes hard and callous.

There are two sorts of *yaws*, like the two species of *Farcy* in horses; the *common yaws* and the *running yaws*.

The *common yaws*, without fever or indisposition, begins with small pimples, which soon increase, and appear in round, white, flabby, eruptions, from about the size of a pea to that of a large strawberry, separately, or in clusters, in different parts of the body. These eruptions do not appear all at once; and, when some are declining, and others disappearing, a fresh crop comes out in a different part of the body. Sometimes a few doses of sulphur will force them out, when they are thought to be entirely gone from the habit.

The *running yaws* breaks out in spreading cutaneous ulcers, discharging a great quantity of acrid corrosive matter, in different parts of the body. This is the worst sort.

The cure of the *yaws* is now understood by skilful practitioners. Inoculation is performed with success. Care soon removes the principal mischief of the distemper; and the *crab yaws* are easily cured in the manner which I have related in another publication*.

Formerly there was no regular method of treating the *yaws* in the West Indies. It was thought to be a disorder that would have its course, and, if interrupted, that it would be

* *Treatise on Tropical Diseases*, ed. 3, p. 519.

dangerous.

dangerous. It was then the custom, when a negro was attacked with it, to separate him from the rest, and send him to some lonely place by the sea side, to bathe; or into the mountains, to some Provision Ground, or Plantain Walk; where he could act as a watchman, and maintain himself, without any expence to the estate, until he was well; then he was brought back to the Sugar-Work.

But this rarely happened. A cold, damp, smoky hut, for his habitation; snakes and lizards his companions; crude, viscid food, and bad water, his only support; and shunned as a leper;—he usually sunk from the land of the living.

But some of these abandoned exiles lived, in spite of the common law of nature, and survived a general mutation of their muscles, ligaments, and osteology; became also hideously white in their woolly hair and skin; with their limbs and bodies twisted and turned, by the force of the distemper, into shocking grotesque figures, resembling woody excrescences, or stumps of trees; or old Egyptian figures, that seem as if they had been made of the ends of the human, and beginnings of the brutal form; which figures are, by some antiquaries, taken for gods, and by others, for devils.

In

In their banishment, their huts often became the receptacles of robbers and fugitive negroes; and, as they had no power to resist any who chose to take shelter in their hovels, had nothing to lose, and were forsaken by the world, a tyger would hardly molest them. Their desperate guests never did.

The host of the hut, as he grew more misshapen, generally became more subtle;—this we observe in England, in crooked scrophulous persons;—as if Nature disliked people's being both cunning, and strong.

Many of their wayward visitors were deeply skilled in magic, and what we call the *black art*, which they brought with them from Africa; and, in return for their accommodation, they usually taught their landlord the mysteries of figils, spells, and forcery; and *illuminated* him in all the occult science of OBI*.

These

* This OBI, or, as it is pronounced in the English West Indies, *Obeah*, had its origin, like many customs among the Africans, from the ancient Egyptians.

אוב OB is a demon, a spirit of divination, and magic. When Saul wanted to raise up Samuel from the dead, he said to his servants, "Seek me a woman (**בַּעֲלַת אֹב** eminent for OB) that hath a familiar spirit."

His

These ugly, loathsome creatures thus became oracles of woods, and unfrequented places; and were resorted to secretly, by the wretched in mind, and by the malicious, for wicked purposes.

OBI, and *gambling*, are the only instances I have been able to discover, among the natives of the negro land in Africa, in which any effort at combining ideas, has ever been demonstrated.

The science of OBI is very extensive.

OBI, for the purposes of bewitching people, or consuming them by lingering illness, is made of grave dirt, hair, teeth of sharks, and other creatures, blood, feathers, egg-shells, images in wax, the hearts of birds, and some potent roots, weeds, and bushes, of which Europeans are at this time ignorant; but which were known, for the same purposes, to the ancients.

Certain mixtures of these ingredients are burnt; or buried very deep in the ground;

His servants replied to him, "There is אִשָּׁת בְּעֵלְתָּ אוֹב (a woman mistress in the art of OB) that hath a familiar spirit, at Endor."

When the witch of Endor came to Saul, he said to her, "Divine unto me (בְּאוֹב by thy witchcraft OB) by the familiar spirit, and bring me him up whom I shall name unto thee." 1 Samuel, chap. xxviii. v. 7 and 8.

or

or hung up a chimney; or laid under the threshold of the door of the party, to suffer; with incantation songs, or curses, performed at midnight, regarding the aspects of the moon. The party who wants to do the mischief, is also sent to burying-grounds, or some secret place, where spirits are supposed to frequent, to invoke his dead parents to assist him in the curse.

A negro, who thinks himself bewitched by OBI, will apply to an *Obi-man*, or *Obi-woman*, for cure.

These magicians will interrogate the patient, as to the part of the body most afflicted. This part they will torture with pinching, drawing with gourds, or calabashes, beating, and pressing. When the patient is nearly exhausted with this rough *magnetising*, OBI brings out an old rusty nail, or a piece of bone, or an ass's tooth, or the jaw-bone of a rat, or a fragment of a quart bottle, from the part; and the patient is well the next day.

The most wrinkled, and most deformed *Obian* magicians, are most venerated. This was the case among the Egyptians and Chaldeans.

In general, *Obi-men* are more sagacious than *Obi-women*, in giving, or taking away diseases; and

and in the application of poisons. It is in their department to blind pigs, and poultry ; and lame cattle.

It is the province of the *Obi-women* to dispose of the passions. They sell foul winds for inconstant mariners ; dreams and phantasies for jealousy ; vexation, and pains in the heart, for perfidious love ; and for the perturbed, impatient, and wretched, at the tardy acts of time,—to turn in prophetic fury to a future page in the book of Fate,—and amaze the ravished sense of the tempest-tossed querent.

Laws have been made in the West Indies to punish this *Obian* practice with death ; but they have had no effect. Laws constructed in the West Indies, can never suppress the effect of ideas, the origin of which, is in the centre of Africa.

I saw the *OBI* of the famous negro robber, *Three fingered JACK*, the terror of Jamaica in 1780 and 1781. The Maroons who slew him brought it to me.

His *OBI* consisted of the end of a goat's horn, filled with a compound of grave dirt, ashes, the blood of a black cat, and human fat ; all mixed into a kind of paste. A black cat's foot, a dried toad, a pig's tail, a slip of parchment

ment of kid's skin, with characters marked in blood on it, were also in his *Obian* bag.

These, with a keen sabre, and two guns, like *Robinson Crusoe*, were all his *OBI*; with which, and his courage in descending into the plains and plundering to supply his wants, and his skill in retreating into difficult fastnesses, commanding the only access to them, where none dared to follow him, he terrified the inhabitants, and set the civil power, and the neighbouring militia of that island, at defiance, for two years.

He had neither accomplice, nor associate. There were a few runaway negroes in the woods near Mount Libanus, the place of his retreat; but he had crossed their foreheads with some of the magic in his horn, and they could not betray him. But he trusted no one. He scorned assistance. He ascended above *SPARTACUS*. He robbed alone; fought all his battles alone; and always killed his pursuers.

By his magic, he was not only the dread of the negroes, but there were many white people, who believed he was possessed of some supernatural power.

In hot climates females marry very young; and often with great disparity of age. Here

JACK

JACK was the author of many troubles :—for several matches proved unhappy.

“ Give a dog an ill name, and hang him.”

Clamours rose on clamours against the cruel *forcerer* ; and every conjugal mishap was laid at the door of JACK’s malific spell of *tying the point*, on the wedding day.

GOD knows, poor JACK had sins enough of his own to carry, without loading him with the sins of others. He would sooner have made a *Medean* cauldron for the whole island, than disturb one lady’s happiness. He had many opportunities ; and, though he had a mortal hatred to white men, he was never known to hurt a child, or abuse a woman.

But even JACK himself was born, to die.

Allured by the rewards offered by Governor DALLING, in a proclamation, dated the 12th of December, 1780, and by a resolution which followed it, of the House of Assembly*, two negroes,

* HOUSE OF ASSEMBLY, 29th December, 1780.

RESOLVED, that, over and above the reward of one hundred pounds offered by his Majesty’s proclamation for taking or killing the rebellious negro called *Three fingered JACK*, the further reward of FREEDOM shall be given to any slave that shall take or kill the said *Three fingered JACK*, and that the House will make good the value of such slave to the proprietor thereof. And if any one of his accomplices will kill the said *Three fingered JACK*, and bring in his

negroes, named QUASHEE, and SAM (SAM was Captain DAVY's son, he who shot a Mr. THOMPSON, the master of a London ship, at Old Harbour), both of *Scots Hall* Maroon Town, with a party of their townsmen, went in search of him.

QUASHEE, before he set out on the expedition, got himself christianed, and changed his name to JAMES REEDER.

The expedition commenced; and the whole party had been creeping about in the woods, for three weeks, and blockading, as it were, the deepest recesses of the most inaccessible part of the island, where JACK, far remote from all human society, resided,—but in vain.

REEDER and SAM, tired with this mode of war, resolved on proceeding in search of his retreat; and taking him, by storming it, or perishing in the attempt.

They took with them a little boy, a proper spirit, and a good shot, and left the rest of the party.

his head, and hand wanting the fingers, such accomplice shall be entitled to his *free* PARDON, and his FREEDOM as above, upon due proof being made of their being the head and hand of the said *Three fingered* JACK.

By the HOUSE,

SAMUEL HOWELL, Cl. Assen.

These

These three, whom I well knew, had not been long separated, before their cunning eyes discovered, by impressions among the weeds and bushes, that some person must have lately been that way.

They softly followed these impressions, making not the least noise. Presently they discovered a smoke.

They prepared for war. They came upon JACK before he perceived them. He was roasting *plantains*, by a little fire on the ground, at the mouth of a cave.

This was a scene :—not where ordinary actors had a common part to play.

JACK's looks were fierce and terrible. He told them he would kill them.

REEDER, instead of shooting JACK, replied, that his OBI had no power to hurt him ; for he was christianed ; and that his name was no longer QUASHEE.

JACK knew REEDER ; and, as if paralysed, he let his two guns remain on the ground, and took up only his cutlafs.

These two had a desperate engagement several years before, in the woods ; in which conflict JACK lost the two fingers, which was the origin of his present name ; but JACK then beat REEDER, and almost killed him, with se-

veral others who assisted him, and they fled from JACK.

To do *Three-fingered* JACK justice, he would now have killed both REEDER and SAM; for, at first, they were frightened at the sight of him, and the dreadful tone of his voice; and well they might: they had besides no retreat, and were to grapple with the bravest, and strongest man in the world.

But JACK was cowed; for, he had prophesied, that *white* OBI would get the better of him; and, from experience, he knew the charm would lose none of its strength in the hands of REEDER.

Without farther parley, JACK, with his cutlafs in his hand, threw himself down a precipice at the back of the cave.

REEDER's gun missed fire. SAM shot him in the shoulder. REEDER, like an English bull-dog, never looked, but, with his cutlafs in his hand, plunged headlong down after JACK. The descent was about thirty yards, and almost perpendicular. Both of them had preserved their cutlasses in the fall.

Here was the stage,—on which two of the stoutest hearts, that were ever hooped with ribs, began their bloody struggle.

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The little boy, who was ordered to keep back, out of harm's way, now reached the top of the precipice, and, during the fight, shot JACK in the belly.

SAM was crafty, and coolly took a round about way to get to the field of action. When he arrived at the spot where it began, JACK and REEDER had closed, and tumbled together down another precipice, on the side of the mountain, in which fall they both lost their weapons.

SAM descended after them, who also lost his cutlafs, among the trees and bushes in getting down.

When he came to them, though without weapons, they were not idle ; and, luckily for REEDER, JACK's wounds were deep and desperate, and he was in great agony.

SAM came up just time enough to save REEDER ; for, JACK had caught him by the throat, with his giant's grasp. REEDER then was with his right hand almost cut off, and JACK streaming with blood from his shoulder and belly ; both covered with gore and gashes.

In this state SAM was umpire ; and decided the fate of the battle. He knocked JACK down with a piece of a rock.

When the lion fell, the two tigers got upon him, and beat his brains out with stones.

The little boy soon after found his way to them. He had a cutlass, with which they cut off JACK's head, and THREE-FINGERED HAND, and took them in triumph to Morant Bay.

There they put their trophies into a pail of rum; and, followed by a vast concourse of negroes, now no longer afraid of JACK's OBI, they carried them to Kingston, and Spanish Town; and claimed the reward of the King's Proclamation, and the House of Assembly.

But, to return into medicine's melancholy road.

In North America, lately, the Plague has burst on the inhabitants. It first appeared at Philadelphia in August, 1793.

DOCTOR BENJAMIN RUSH, of Philadelphia, a physician of the most distinguished learning and talents, has given an interesting account of this calamity. He has denominated this pestilence the *Bilious Remitting Yellow Fever* of America; from its being accompanied by the terrible complexion, and other pathognomonic, which I have given of the *Endemial Causas*, or, as it is commonly called, the *Yellow Fever*
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of the West Indies; and from its yielding, as he has shewn, to the same means I used in that fever, and have published in my *Treatise on Tropical Diseases*.

From the mortality that has happened, at different periods, from the *Yellow Fever*, since its first appearance in America, I am sorry to conclude that no successful method of treating it has been adopted by practitioners, and universally agreed on.

It seems that America is now suffering the same fate which England formerly experienced; and that this American plague, like the plagues in England, will exhaust the inscrutable cause which feeds its rage, and then will vanish. England was relieved from the plague, without any general rational method of cure being adopted, or without physicians knowing any more how it came, or went away, than we do when it will return.

This is a subject of concern; but not of surprise. Veteran physicians in times of danger generally desert the field; intrench themselves far off, behind old books, and leave raw recruits to fight the foe: who, inexperienced in the tactics of physic, seldom escape the recoil of their own artillery; and fall with their patients.

It was natural for HIPPOCRATES, who lived in a country, where particular winds regularly produced certain diseases, to attribute all epidemics to some condition of the air, that was cognizable to our senses.

But SYDENHAM, who, we all know, was a sagacious observer of nature, though he thought with HIPPOCRATES as to the atmospheric origin of epidemics, yet he contended that there was some secret and unknown quality in the air, not reducible to demonstration, by the divisions and subdivisions of theory, in which the Pandoran mischief of epidemics lies concealed.

There are annual or seasonal disorders, more or less severe, in all countries; but the Plague, and other great depopulating epidemics, do not always obey the seasons of the year.

Like comets, their course is excentric. They have their revolutions; but from whence they come, or whither they go after they have made their revolutions, no mortal can tell.

All epidemics properly belong to either spring or autumn. When they break out in winter, or very early in the spring, they generally prove the most malignant and destructive. The same may be said of autumnal epidemics,
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in regard to their premature appearance, in summer.

Vernal pestilential diseases, and plagues, terminate, or become mild, or quiescent, in hot weather. Autumnal diseases, in cold weather. The measles and small-pox, when epidemic, do the same.

The plagues of 1119, 1656, and several others in England; of 1348, in Venice; of 1713, in Dantzic, Hamburg, and Stockholm; all broke out during the frost in winter; and most of them declined with the summer heat. Such was the case with the plague at Toulon, in 1721; and so it is with the plagues at Constantinople, and Cairo, when they make their appearance in February.

No person ever knew the cause of the *Sweating Sickness* in England; nor of its five periodical appearances from the year 1483 to 1551: nor why it has never since returned.

In diseases, even of confined local production, we are often deceived by the semblance of truth.

Has any person a rational cause to assign for Agues in the hundreds of Essex; or the Bronchocele in Alpine countries?

What did PLINY know of the *Gemursa*; or what do we know of the *Mentagra**?

* PLIN. lib. XXVI. c. 1.

To look for the cause of an epidemic in the present state of the air, or weather, when it makes its appearance, is a very narrow, contracted, method of scrutiny.

The cause of a pestilence in summer, may be in the changes which the earth, and consequently its surrounding atmosphere, underwent in the preceding winter; and from combinations, perhaps, far beyond our scope of thought, for years preparatory to its eruption.

In a new country like North America, where immense districts of the surface of the earth, which from the creation never saw the sun, have been exposed, for agriculture, the air of the country must have been impregnated from exhalations injurious, probably, to its salubrity.

The Americans are not to look for the cause of their *Yellow Fever*, on dunghills, in rotten vegetable substances, and about the wharfs and neighbourhood of Philadelphia. Nature does not deal in such commodities. She does nothing on so small a scale.

This pestilence has a far more expanded origin. And I verily believe, that their melancholy officers of health; avoiding what they call infected persons; and putting marks on the doors and windows of an house where any person is ill, and similar acts of charitable
and

and good intention, only tend to frighten the people; and dishearten them, at a time they stand most in need of fortitude.

Exposing the well-known umbrous *Pontini* marshes, by cutting down the woods, which kept their foul vapours from being rarified by the sun, and borne away by the winds, produced great pestilence in Italy.

The idea also of the American plague being imported from *Bulam*, or any other place, is repugnant to reason. I was told a similar tale, when I first went to the West Indies: that the *Yellow Fever* there, was imported in the beginning of the century from *Siam*. That it was a contagious, and an original putrid disease; and that bleeding was death. In my practice I proved the reverse of all this.

The cause of pestilential epidemics, cannot be confined, and local. It must lie in the atmosphere, which surrounds, and is in contact with every part of us; and in which we are immersed, as bodies in fluids.

These diseases not appearing in villages, and thinly inhabited places, and generally attacking only great towns and cities, may be, that the atmosphere, which I conceive to be the universal propagator of pestilence, wants a commixture, or union, with some compound-
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ed, and peculiar air, such as is generated in popular communities,—to separate, or release its imprisoned virulence, and give it force.

The ancient writers on medicine, and indeed all others, which I have read, assert, that the operation, of whatever they assign to be the cause of epidemical fevers,—is solely on the blood and fluids. This may be doubted.

The impressions of the atmosphere, on the surface of the body, when contaminated, or deprived of vitality, like East winds, are as perceptible, as the effects of approaching, or retreating from, a fire.

In the common order of pestilential fevers, they commence with coldness, and shivering; simply demonstrating, that something unusual has been in contact with the skin, agonizing cutaneous sensibility.

The skin is covered with the extremities of fibres, nerves, and vessels;—these are in the most exposed situation, with the least power of resisting external injury.—Hence a destruction, or a privation of their elasticity, and restraining power, from a poisoned atmosphere.—And hence I conceive that the first blow in these fevers is made, on the solids;—the strength of the whole frame is thus prostrated in a moment, and every nerve and muscle paralyzed.

Sickness

Sickness at the stomach, and an immoveable pressure about the præcordia follow. These demonstrate, that the blood cannot pervade the extremities of the body, and that the quantity which ought to dilate through the whole machine, is confined to the larger organs, and is crowding, and distending the heart, and central vessels.

The restraining power of the remoter blood vessels being destroyed, the thinner parts of the blood escape their boundaries; hence arises yellowness in the skin, in some climates:—in others, the grosser parts of the blood stagnate, forming black lodgements, bubo, anthrax, and exanthemata.

The object in these fevers, is to decide the contest between the solids and the fluids; and this appears to me, to be only practicable, by draining the vital parts, by bleeding and purging, before the fluids have burst their confines, and dissolved their bond of union with the solids.—The next step is to regain the lost energy of the surface of the body, by exciting perspiration; and then of the whole system, by tonics.

When these things are not done in the first hours of attack, in pestilential fevers, and the conflict is not *extinguished* at once,—bark, stimulants,

ed, and peculiar air, such as is generated in popular communities,—to separate, or release its imprisoned virulence, and give it force.

The ancient writers on medicine, and indeed all others, which I have read, assert, that the operation, of whatever they assign to be the cause of epidemical fevers,—is solely on the blood and fluids. This may be doubted.

The impressions of the atmosphere, on the surface of the body, when contaminated, or deprived of vitality, like East winds, are as perceptible, as the effects of approaching, or retreating from, a fire.

In the common order of pestilential fevers, they commence with coldness, and shivering; simply demonstrating, that something unusual has been in contact with the skin, agonizing cutaneous sensibility.

The skin is covered with the extremities of fibres, nerves, and vessels;—these are in the most exposed situation, with the least power of resisting external injury.—Hence a destruction, or a privation of their elasticity, and restraining power, from a poisoned atmosphere.—And hence I conceive that the first blow in these fevers is made, on the solids;—the strength of the whole frame is thus prostrated in a moment, and every nerve and muscle paralyzed.

Sickness

Sickness at the stomach, and an immoveable pressure about the præcordia follow. These demonstrate, that the blood cannot pervade the extremities of the body, and that the quantity which ought to dilate through the whole machine, is confined to the larger organs, and is crowding, and distending the heart, and central vessels.

The restraining power of the remoter blood vessels being destroyed, the thinner parts of the blood escape their boundaries; hence arises yellowness in the skin, in some climates:—in others, the grosser parts of the blood stagnate, forming black lodgements, bubo, anthrax, and exanthemata.

The object in these fevers, is to decide the contest between the solids and the fluids; and this appears to me, to be only practicable, by draining the vital parts, by bleeding and purging, before the fluids have burst their confines, and dissolved their bond of union with the solids.—The next step is to regain the lost energy of the surface of the body, by exciting perspiration; and then of the whole system, by tonics.

When these things are not done in the first hours of attack, in pestilential fevers, and the conflict is not *extinguished* at once,—bark, stimulants,

stimulants, and cordials, may be called on—like undertakers,—to perform an useless ceremony.

Importing epidemics, and the existence of contagion in pestilential diseases, are contrary to the opinion I ever had, and still maintain.

From whence was the importation of the contagion of the plague at Naples in 1656; by which 20,000 people died in one day?

Can any person, for a moment reflecting, believe that the great plague of London in 1665, was caused by opening a bag of cotton in the city, or a package of hemp in St. Giles's parish?

Is it possible to suppose that people should have been found to propagate, or believe the well-known and favourite story of the advocates for MEAD's theories,—that a lady was killed instantly by smelling at a Turkey-handkerchief; and a gentleman by only walking over a Turkey-carpet!

One might ask—What became of the persons, who delivered the handkerchief to the lady—and laid down the carpet for the gentleman?

I have seen almost all the lazarettos, hospitals, and prisons in Europe. The worst governments abroad, most abound with this splendid

splendid inheritance of paupers, and criminals
—the children of bad state-parents.

In some foreign countries, from the number and extent of the last description of edifices, one would imagine that whole nations were criminals, or expected to become so.

Even in these false, cheating, impositions on benevolence,—where pomp and magnificence is pictured without,—and neglect, dirt, misery, and often malicious oppression, are found within, I never could discover that fevers are propagated by contagion. Were it possible so to be, I should have been long since dead.

Quarantine, always expensive to commerce, and often ruinous to individuals, is a reflexion on the good sense of countries.

No pestilential fever was ever imported, or exported; and I have always considered the fumigating ship-letters, and shutting up the crews and passengers of vessels, on their arrival from foreign places, for several weeks, for fear they should give diseases to others, which they have not themselves—as an ignorant, barbarous custom.

I shall

I shall now conclude this treatise ; not without hopes that the difficulties I mentioned, in the way of a correct history of SUGAR, have sufficiently appeared, to justify my motives in premising them : and to extenuate many defects in the execution of this undertaking.

The political government, civil administration of public and private affairs, and the commercial interests of the sugar colonial settlements, have been well delineated by historians of different nations.

In England, we have the father of correct English-West-Indian literature, Mr. EDWARD LONG ; and, since his invaluable publication, we have the learned, and comprehensive view of those countries by Mr. BRYAN EDWARDS.

These enlightened historians have left scarcely any information unfolded, respecting the West-Indian islands, from the time they were first known to Europeans, down to their own days.

Much also of curious matter has been given by other ingenious men, concerning branches of the natural history of the West-Indies ; but the anatomy in general, in this department, is without their method and science.

Great

Great beauties, and sublime objects, are still untouched by Europeans; and the SUGAR CANE, the heart of the solar world, has never been dissected.

By the Planter, the SUGAR CANE has been no further considered, than as it relates to the engine, and the copper.

In the precious fluid of its cells, he has found that, which philosophers have so long searched for in vain.

Wrapt in the rich fancy of its all-powerful influence, his chief concern is in its transmutation:—but he gives the world the blessings of his alchemy.

In the season of this great—this fascinating work—a sugar-plantation represents the days of Saturn.—Every animal seems to be a member of the golden age.

At home, the merchant, from this transatlantic operation, supports legions of manufacturers. With pointed finger on the globe, he follows the car of Phœbus, with anxious care, through the heavenly signs propitious to his views; collects his rays from equatorial climes; diffuses their genial warmth over the frigid regions of the earth, and makes the industrious world one great family.

LONDON, *Pall Mall*,
1st of January, 1799.

B. M.

amount of duties paid thereon, from the year 1764 to 1791, both inclusive. Also, an ACCOUNT of the QUANTITY of RAW and REFINED SUGARS EXPORTED FROM GREAT BRITAIN in the above periods; with the amount of Drawbacks and Bounties paid thereon, distinguishing each year, and the Raw from the Refined; distinguishing also the quantities exported to Ireland.

British Plantation Sugar imported.				British Plantation Sugar exported.				Refined Sugar exported.													
Yrs.	Quantity.		Duty.	To Ireland.		To other Parts.		Total.		Drawbacks.		To Ireland.		To all other Parts.		Total.		Bounties.			
	Cwt.	q. lb.		L.	s. d.	Cwt.	q. lb.	Cwt.	q. lb.	Cwt.	q. lb.	L.	s. d.	Cwt.	q. lb.	Cwt.	q. lb.	L.	s. d.		
1764	1,488,079	— 15	467,814 17	4	119,670	1 13	77,908	3 12	197,579	— 25	62,734	8	3,630	— 2	172,672	3 21	176,302	3 29	127,819	11 10	
5	1,227,159	3 18	385,788 7	—	136,004	3 8	13,120	1 25	149,125	1 5	47,160	17	9,771	1 12	105,074	— 16	114,851	2	83,269	6 9	
6	1,522,732	2 19	478,709 1	—	125,558	1 26	31,678	— 6	129,236	2 4	40,871	— 6	5,378	— 14	22,223	3 24	27,602	— 10	20,011	10 3	
7	1,538,834	1 8	480,895 19	5	185,156	2 20	29,376	3 5	209,533	1 25	66,264	19	5,584	— 13	30,384	— 27	35,968	1 12	26,077	1 2	
8	1,651,512	2 14	519,194 5	6	183,049	3 5	44,144	— 16	227,193	3 21	71,850	1 8	6,552	— 6	32,721	2 21	39,273	2 27	28,473	8 5	
9	1,525,070	— 5	479,443 17	—	195,382	3 5	21,001	— 23	216,384	—	68,431	8	7,414	1 15	26,627	1 1	34,041	2 16	24,680	3 3	
1770	1,818,229	1 23	571,605 17	5	127,181	2 —	72,566	3 9	199,738	1 9	63,167	4 5	3,802	3 6	39,806	1 13	43,609	1 19	31,616	16 8	
1	1,492,096	2 24	469,077 17	10	192,120	2 17	37,738	2 12	195,859	1 1	61,940	9 10	8,842	3 20	46,367	— 22	55,210	— 13	40,027	6 9	
2	1,804,080	2 26	565,157 17	6	184,252	2 5	11,596	— 3	183,865	2 8	58,128	6 7	10,167	3 2	21,813	— 17	31,980	3 19	23,186	3 3	
3	1,802,725	1 25	638,104 18	8	211,304	1 25	4,937	— 22	189,189	3 11	59,831	5 8	9,784	— 27	19,050	3 15	28,835	— 13	20,905	9 3	
4	2,029,725	3 23	635,370 14	12	255,684	3 12	82,963	1 17	344,648	1 1	108,995	— 2	7,899	2 14	24,613	3 9	32,513	1 23	23,572	5 2	
5	2,021,059	3 23	542,770 15	—	201,757	— 7	113,696	1 8	315,453	1 15	99,763	14 11	12,941	2 3	55,907	2 9	68,849	— 12	49,915	12 —	
6	1,726,507	1 16	445,246 11	4	150,241	3 —	11,572	3 26	161,814	2 26	51,173	18 2	5,530	2 21	55,522	2 21	71,053	1 14	51,513	13 11	
7	1,416,291	1 5	478,304 13	7	130,865	1 26	11,897	2 19	142,763	— 17	45,148	16 10	7,013	1 8	48,908	— 17	55,921	1 25	40,543	1 4	
8	1,521,457	1 24	506,671 18	5	92,793	1 25	6,223	2 16	99,017	— 13	32,870	10 6	7,411	1 3	18,716	1 18	26,127	2 21	18,942	11 5	
9	1,525,833	—	463,080 19	—	116,700	— 19	1,853	2 6	118,553	2 25	39,391	18 —	6,254	2 7	22,068	1 18	38,322	3 25	27,784	3 12	
1780	1,394,559	1 23	633,647 2	—	142,493	1 24	27,067	1 3	169,560	2 27	99,228	7 3	2,033	2 17	51,508	1 12	63,542	— 1	46,067	19 1	
1	1,080,843	2 9	844,030 15	10	83,646	— 11	7,615	1 21	91,261	2 4	56,049	15 8	7,643	— 22	24,824	1 12	32,467	2 6	42,207	16 4	
2	1,374,264	3 24	973,909 —	—	154,756	1 6	18,382	— 15	173,138	1 21	106,333	17 1	10,977	— 24	93,798	— 9	104,775	1 5	136,207	17 7	
3	1,584,275	— 18	1,094,682 1	7	133,149	1 19	7,330	1 13	140,479	3 4	86,345	3 4	5,288	— 27	126,321	— 27	131,609	1 20	171,092	6 6	
4	1,728,386	— 3	1,274,954 14	2	199,218	2 24	3,735	1 9	202,954	— 5	125,154	19 9	6,894	— 5	129,099	1 21	135,993	2 26	176,791	17 —	
5	2,075,909	3 24	1,274,954 14	—	98,266	— 5	3,767	2 2	102,033	2 7	62,665	11 2	8,500	3 17	73,049	3 12	81,750	3 1	106,275	19 8	
6	1,613,965	1 14	992,301 —	—	196,636	3 20	2,779	1 16	199,416	1 8	122,973	7 11	14,320	1 4	62,415	— 15	76,735	1 19	99,756	— 10	
7	1,926,621	— 26	1,188,083 1	10	138,681	3 19	6,391	2 10	145,073	2 1	89,461	19 10	8,001	2 22	77,399	2 21	85,401	1 15	111,021	15 11	
8	2,065,817	1 23	1,273,920 15	—	148,245	3 —	5,561	2 15	153,813	1 15	99,808	19 11	10,702	1 11	127,837	2 —	138,539	3 11	180,101	16 —	
9	1,936,440	— 2	1,194,915 2	6	139,193	3 24	2,991	1 7	142,185	1 3	87,680	18 4	8,484	—	111,332	2 10	119,817	— 4	155,762	2 11	
1790	1,882,106	— 4	1,160,645 12	4	122,086	3 22	12,383	1 14	135,470	3 8	81,116	11 1	10,626	— 16	147,947	2 8	158,573	3 24	206,146	3 —	
1	1,808,950	— 7	1,250,802 10	0																	

The value of the whole of the British West Indian products imported, for the following years, according to the Custom-House prices.

Years.	Value.	Years.	Value.
	£.		£.
1764	2,391,552	1778	3,059,922
1765	2,196,549	1779	2,836,489
1766	2,704,114	1780	2,612,236
1767	2,690,673	1781	2,023,546
1768	2,942,717	1782	2,612,910
1769	2,686,714	1783	2,820,387
1770	2,110,026 *	1784	3,531,705
1771	2,979,378 †	1785	4,400,956
1772	3,530,082	1786	3,484,025
1773	2,902,407	1787	3,758,087
1774	3,574,702	1788	4,307,866
1775	3,688,795	1789	3,917,301
1776	3,340,949	1790	3,854,204
1777	2,840,802		

* The value of the produce of St. Domingue, according to account published in France this year, amounted to £.2,923,333 viz. Sugar £.2,400,000; Coffee £.83,333; Cotton £.120,000; Indigo £.300,000; Tanned Leather £.20,000.

† The accounts preceding, refer to England only. Those for the year 1771, and all subsequent, are for England and Scotland.

N. B. The total of ships cleared outwards from England and Scotland from December 1786 to December 1787 was 528, amounting to 123,581 tons; and the amount of those entered inwards was 576, amounting to 132,222 tons. The amount of goods of British produce, and manufactures, exported from Great Britain to the West Indian colonies in 1787, was £.1,463,879 14s. 11d.

An account of the products entered for exportation from St. Domingue to France, for the following years.

Years.	Sugar Clayed.	Ditto Muscovado.	Coffee.	Cotton.	Indigo.
	lb.	lb.	lb.	lb.	lb.
1783	77,339,113	44,312,919	44,573,479	4,871,718	1,868,728
1784	65,053,050	77,344,464	52,885,095	4,756,857	1,555,142
1785	66,589,357	83,610,521	51,368,109	4,486,261	1,546,575
1786	71,063,697	61,887,814	52,180,311	5,203,161	1,103,907
1787	56,182,403	72,896,676	70,003,161	6,806,174	1,166,177
1788	70,227,709	93,177,512	68,151,181	6,286,126	930,016
1789	47,516,531	91,899,963	76,286,530	6,871,204	958,626

N. B. The above are heavier than English weights by 8 *per cent.*

St. Domingue was generally considered in France to yield about two-thirds of all their West Indian produce; and, in 1788, this island alone loaded for France 580 ships, of 370 $\frac{1}{4}$ tons on a medium, and 110 of 740 tons: exclusive of the numerous French and foreign vessels employed in the trade with North and South America, amounting, in the whole, to 296,435 tons, nearly equal to one-third of the private ships of Great Britain.

COLUMBIA		COLUMBIA		COLUMBIA	
1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30
31	32	33	34	35	36
37	38	39	40	41	42
43	44	45	46	47	48
49	50	51	52	53	54
55	56	57	58	59	60
61	62	63	64	65	66
67	68	69	70	71	72
73	74	75	76	77	78
79	80	81	82	83	84
85	86	87	88	89	90
91	92	93	94	95	96
97	98	99	100	101	102

